

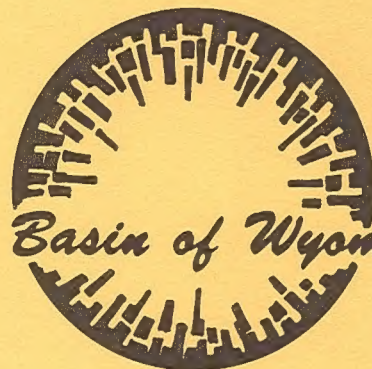


VOLUME VI

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FINAL ENVIRONMENTAL IMPACT STATEMENT

Eastern Powder River Coal Basin of Wyoming



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This is Volume VI. It contains a summary of the public hearings and the written comments received in response to the draft environmental statement. It also contains responses of the preparing agencies to the comments.

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PUBLIC COMMENTS AND RESPONSES

Numerous comments on the draft environmental statement have been received. Oral testimony was received at formal public hearings, and letter comments were received from federal and state agencies, private organizations and individuals. All comments and the hearing transcript will be transmitted with the final environmental statement to the Secretaries of Interior and Agriculture, the Interstate Commerce Commission and the Council on Environmental Quality for review and will be available for public inspection at the State Director's office, Bureau of Land Management, Federal Center, Cheyenne, Wyoming.

As would be expected, many comments are similar in nature. To reduce repetition, a comment once responded to, is not answered again under a different heading in this volume, i.e., if a comment was addressed under the hearing transcript portion, the response will not be repeated under the letter portion. The same holds true within the letter portion if the comment is repeated in another letter. Therefore, responses to individual letters are predicated, in part, upon questions and issues previously discussed or answered.

General

Many comments of a general nature were received. Comments of this type are discussed in this section rather than under the hearing or letter sections.

Some expressed the belief that the draft environmental statement was recommending a particular course of action. It is not the purpose of the statement to make recommendations or to take a management position. To the extent possible, the statement factually portrays potential impacts of proposed actions and various alternatives to the proposed development. Even though certain alternatives were discussed and analyzed (i.e., control number of producers; control location of depletion by designating area for production) this in no way indicates that the statement is recommending that these alternatives be

implemented. The purpose is to supply the decision maker a range of possible alternatives that may be available for consideration.

Concern was also expressed by many that the statement would allow development without full knowledge of the potential impacts. This concern stems from statements in the document that certain data are not available or that the extent and magnitude of certain impacts are unknown at this time. The authors of this statement are not taking a position on development. The statement is not the decision document but comprises one element in the decision making process. The purpose of the statement is to provide environmental information to the decision maker. This information describes possible environmental impacts that may occur from the proposed actions if allowed and the data gaps which at this time prohibit a more thorough and comprehensive analysis of some of the potential impacts. It is the decision maker who must determine if the proposed development is to proceed in a designated manner prior to development of data to fill the indicated gaps. This determination will be made by balancing the environmental impacts identified in the statement along with economic, technical and policy issues involved.

Many commenters were confused on the extent of the impacts portrayed, particularly in the chapters titled "Probable Impact of the Proposed Action." The purpose of this chapter in all cases is to describe the total probable impacts (beneficial and adverse) that may occur if the projects are implemented as proposed. The chapter entitled "Significant Mitigating Measures" describes those measures which could be implemented to reduce the number, severity or magnitude of impacts described in chapters titled "Probable Impact of the Proposed Action," and the authority for imposing those measures.

Questions were also raised as to why certain items were not included in the section on mitigation measures, particularly with respect to socio-economics and wildlife impacts. No mitigating measures were mentioned that could not be legally required under existing federal, state, or local statute. Several replies received from industry appear to support this stand, e.g., "If there is no present law which specifically requires the indicated action, the paragraph should be deleted." If the mitigating section was to contain a listing of all desirable management measures, it could mislead the reader as well as the decision maker into believing everything was well in hand when in all probability, there may be no legal authority to enforce these measures. Therefore, only those measures were discussed which presently have a legal basis for enforcement.

50 Percent grazing productivity

Numerous comments from all sources were received concerning the assumption made in the draft EIS that there will be a 50[/]percent loss in productivity on reclaimed land. Conflicting comments involved the idea that 50 percent was either too high or too low. No sound analysis or research evidence has been presented to either refute or prove the "50 percent" assumption. Research conducted on rangeland which has not been severely disturbed as occurs in stripmining cannot be scientifically applied to stripmined areas. Analysis and response to comments concerning the assumed 50 percent loss in productivity is as follows:

Very little information based on actual demonstration is available on mined land rehabilitation results within the Powder River Basin or for that matter the semiarid western lands. No current studies deal specifically with the problem of maintaining long-term grazing use on reclaimed mined lands. Current research is orientated primarily to the immediate problem of successfully revegetating

mine spoils. The level of productivity attained over time relates only incidentally to the problem of reestablishing vegetation.

The assumed 50 percent loss of productivity for grazing use is presented as a guideline for analysis and projected loss of resources based on vegetative production. Although no firm base of research exists to assume a 50 percent loss, several reasons indicate a reduction in productivity can be anticipated in the long term.

Present productivity of grazing lands within the basin is based on climate, existing soils and past use. The National Academy of Science study committee on the potential for rehabilitating lands surface mined for coal in the western United States considered that the maintenance of vegetative cover depends to a major extent upon the degree of soil development. Physical properties of grass-land soils and their influence on primary productivity are measured by the texture, structure, rockiness, bulk density, porosity, consistency and soil depth. These soil properties influence the ecosystem indirectly through their individual and interacting effects on soil aeration, soil water and nutrient relationships (Dix et al 1969). During the mining process, existing soils will be lost, soil characteristics altered and soil productivity, permeability and infiltration rates reduced, and the nutrient cycling process disrupted. Soils within the Powder River Basin have developed over a considerable length of time. The time necessary to reestablish the soil structure and nutrient cycles is undeterminable under present climatic conditions.

Potential productivity could be expected to be further reduced through the inevitable wind and water erosion that will occur during the mining-rehabilitation process. Natural erosion that is a present characteristic of the area could be expected to accelerate or at least continue to some degree even after reclamation.

Both drought and high intensity storms have a distinct high probability of occurrence during the mining and reclamation process. Revegetation failures, erosion, and other problems are anticipated to occur due to climatic extreme. Hodder (1973) recognized the problem that soil, seed and fertilizer may often be washed from spoil slopes before stabilizing vegetation can become established.

The spoil material left on the surface may present problems to reclamation and vegetative production. Overburden segregation may be difficult under some mining methods, and in some cases suitable or desirable surface spoil materials may be absent from the overburden. Hodder (1973), in a research report on surface mined land reclamation research in the Powder River Basin of Montana, considered that "few disturbances of vegetation and soils are as severe as surface mining. The resultant spoils are normally devoid of important plant nutrients, soil micro-organisms, and organic matter. Toxic materials are often manifested in high alkalinity and salinity."

Sandoval, et al (1973), in an evaluation of spoil materials of the Tongue River and Sentinel Butte Formations within the Fort Union group, found spoils to be often extremely fine-textured, moderately saline, and highly sodic. Severity of the problems associated with high clay and high sodium increases with depth from the original surface. Low organic matter combined with fine textures enhances the sodium dispersion effect which renders the spoil materials extremely unstable, highly impermeable, and erodible to water.

The National Academy of Science recognized the problems associated with sodic mine spoil piles within the grassland prairie of eastern Wyoming, Montana, and western North Dakota, and noted in this regard that "shale material invariably presents problems as a medium for plant growth regardless of the characteristics of a site before excavation begins." (National Academy of Science 1973 p. 131)

The significant increases in the grazing capacity and livestock production referred to in comments and testimony have been realized by replacing native range with seeded pastures at the Gillette substation located within the study area. The actual benefit from seeded pastures is achieved through conversion of the native mixture of desirable and undesirable forage plants to a monoculture well suited to livestock production. According to Lang and Landers (1957), these seeded pastures will produce from $1\frac{1}{2}$ to $2\frac{1}{2}$ times more grazing capacity than native shortgrass range. However, they noted, in addition to the expense involved in establishing seeded pastures, their productivity was noted to decrease with age.

Comparison of a monoculture conversion of native vegetation to a pure grass stand, or a seeded pasture, versus reclamation of mined land has very limited validity since the degree of disturbance and resultant conditions are quite dissimilar. Monocultures are not stable, self-sustaining vegetative communities and do not represent a permanent vegetative change. Inevitably, monocultures are invaded by less stable or less desirable forage plants resulting in a decline of overall productivity of the seeded pasture. As the natural plant succession progresses, seeded species are replaced by a vegetation that the climate, soils and grazing pressure will permit. Competition for moisture and nutrients would therefore develop between nonforage and forage species. A seeded pasture would require continued maintenance or periodic reestablishment to maintain a high level of productivity for livestock grazing. Continual manipulation is an expensive process, especially on low production semiarid grazing lands and may be highly undesirable when maintenance of surface stability is a prime objective of the reclamation.

Lang (1973), in a study of the vegetative changes between 1943 and 1965 on the short grass plains of Wyoming, found that a section of abandoned farm land

had deteriorated to a large degree and the cover of perennial grass as well as total ground cover was drastically reduced from 1943 to 1965. The change was found to be so great that this section would have been considered in very poor condition from severe overgrazing. To extrapolate this information and apply cause and affect of the farming on the productivity and plant succession because of the unknown past use of the areas is difficult. However, the long-term productivity of the vegetation following surface disturbance has evidently declined.

There is also a question concerning what degree of grazing pressure reclaimed mined lands can withstand. Erodability of the loose unconsolidated spoil materials may require maintaining an adequate vegetative cover, thereby limiting the amount of grazing use and hence productivity of the area.

5-Year rehabilitation schedule

In addition to comments on the 50 percent productivity loss, a companion item which received numerous comments was the projected 5-year time lag in reclamation. As with the other comments some thought this was too long, while others thought it was much too short. The 5-year schedule was explained in the assumption and analysis guidelines section of Chapter II, Part I of this statement. The 5-year time lag applies to every acre of land which is mined. To further amplify the basis behind the projected time lag, the following response is presented:

The 5-year schedule is used as a guideline for analysis and projections of resource loss that are based on the reestablishment of grazing use. As a point of clarification, the rehabilitation schedule is not the time required for reestablishment of vegetation but reestablishment of grazing use. It is possible that grazing use could be made in a shorter period of time than presented. However, no mined areas to date have been returned to grazing use within the study area. Therefore, no base exists for such an assumption. The

5-year rehabilitation is discussed to demonstrate the rationale used to develop this cycle.

First year - reshaping and topsoiling.

Obviously some time would be required to reshape and topsoil the mined area. This may or may not take an entire year and would be highly dependent on individual mining and rehabilitation sequences.

Second year - fallowing and mulching to allow moisture accumulation.

The National Academy of Sciences study committee on the potential for rehabilitating surface mined for coal in the western United States considered that moisture was the most important limiting factor in successful revegetation of disturbed land surfaces of the west. Fresh mine spoils are, in most cases, deficient in the moisture content required for vegetative establishment; therefore, some form of supplemental moisture source must be provided to assure establishment of vegetation in a semiarid environment.

Supplemental irrigation may be used for seedling establishment; however, to assume that sufficient irrigation water would be available for this purpose was not considered valid because (1) irrigation is not readily available within the potential mining areas and (2) the projected demand for municipal and industrial water would preclude its use for rehabilitation.

Summer fallowing is a common dry farming practice available for insurance of adequate supply of soil moisture for revegetative establishment. This practice was also considered by the National Academy of Science study committee. The practice has been used successfully for years within the study area as an aid to crop production in a semiarid region that experiences a significant variation in yearly precipitation.

Seeding will be completed in the fall of the second year or spring of the third.

Third and fourth years - Deferring grazing to allow for seedling establishment is a common practice. The National Academy study committee considered in its section on the biotic effects of herbivores that: . . .

"Damage by herbivores to newly revegetated areas has been widespread and severe. Fertilized vegetation is especially palatable to livestock and native animals. Management during seedling establishment includes the protection of new seedlings from grazing by appropriate fencing or chemical repellants for at least the first two growing seasons and frequently as long as three of four growing seasons, the criterion being that seedlings should not be grazed until they are firmly rooted."

In the fifth year grazing could be allowed, provided revegetation is successful and seedlings are rooted sufficiently to permit this use.

Benefit-cost

Several questions were raised as to why the document does not contain economic benefits, costs, or benefit/cost analyses or ratios. The purpose of the EIS is to present to the decision maker information on environmental effects resulting from implementing proposed actions. As previously stated, the EIS is not the decision document and therefore does not contain all of the items necessary in making a decision. Other types of information (i.e., political, legal, economic) are needed by the decision maker.

Basis for this conclusion is contained in several places in the Council on Environmental Quality guidelines for preparation of Environmental Impact Statements, i.e.: 40 CFR 1500.2(a)(2) . . . "Federal agencies will, in consultation with other appropriate Federal, State and local agencies and the public assess in detail the potential environmental impact." 1500.2(b)(3) . . . Agencies should consider the results of their environmental assessments along with their assessments of the net economic technical and other benefits of proposed actions . . ." The guidelines further state under the section content of EIS's 1500.8(a)(8) . . . "In this connection, agencies that prepare cost-benefit analyses of proposed actions should attach such analyses, or summaries

thereof . . ." In this case the agencies involved in preparation of the statement do not prepare cost-benefit analyses as a routine matter of business, such as other agencies do, e.g.: Bureau of Reclamation to justify the project and to support the request for project funds. As the EIS is not supposed to justify, support, rationalize or recommend on a project, inclusion of such data could lead the reader to believe that the statement was trying to support the project as well as possibly trying to dictate what state and local budgets should be in the future.

Hearings

Five days of public hearings were conducted. Notice of the public hearings was published in the May 24, 1974 Federal Register on page 18305, 30 days prior to the first scheduled hearing date. In addition to the Federal Register, publication notices and news releases announcing the hearings were sent to 40 newspapers and 31 radio and TV stations. In addition, notices were sent to 30 post offices for placement on their public bulletin boards.

The following summarizes hearing dates, sites, attendance, and number of people who gave testimony.

Public Hearings

<u>Date and Location</u>	<u>Attendance</u>	<u>No. Testifying</u>
6/24 - 7PM - Cheyenne, WY	125	27
6/25 - 9AM - Cheyenne, WY	80	9
6/26 - 1:30PM - Casper, WY	91	11
6/26 - 7PM - Casper, WY	88	14
6/27 - 7PM - Gillette, WY	111	21
6/28 - 9AM - Gillette, WY	<u>55</u>	<u>6</u>
TOTAL	550	88

The draft environmental statement was made public on June 1, 1974, twenty-two days prior to the first scheduled hearing. A 45-day period, to end on July 18, was established to receive written comments. Subsequently, several requests were received to extend the review period and on June 24, 1974 the review period was extended to August 2, 1974. The notice of extension was published in the July 2, 1974 Federal Register on page 24382. The extension notice was disseminated to the public in the same manner as the notice of availability.

Comments received and responses to them follow. In the interest of clarity, certain comments have been paraphrased, summarized or otherwise reworded. Comments which were ambiguous in nature or for which no specific reply was deemed necessary are not addressed below.

Hearing Comments and Responses

1. Comment: The EIS does not relate itself particularly to some of the environmental protection machinery that is already in place within the state government.

Response: The general role of state agencies is explained on pages I-12 and I-13. More detailed references relating to the state's role in specific instances, are pages I-612-613, I-615-617, and I-638-640 of the draft EIS. A section has been added on page I-621A.

2. Comment: The report infers that a bad inversion problem exists in the Powder River Basin. This is not believed to be true.

Response: Based on the limited available information, low-level nocturnal inversions are frequent, especially during the winter months. While the statement reports that upper-level inversions may occur on an average of 40 stagnation-episode days per year, recent upper-level soundings taken by Dr. John Marwitz, University of Wyoming, indicate an almost continual inversion over the study area (Black Thunder Project for A.R.Co.) during the six months of winter.

3. Comment: The inclusion in the statement of emission data based on "no stack emission controls" is misleading. No plant will be constructed without emission controls conforming to EPA's New Stationary Source Performance Standards. For instance, control equipment for Wyodak will reduce particulate emissions to 1,160 tons per year instead of 34,000 tons per year assumed by the Draft EIS on page I-462.

Report fails to recognize, when it predicts pollutants from coal conversion plants and power plants, the existence of both State and Federal standards which have to be met.

Response: Concur. Changes have been made in Parts I and VI, Air Quality,

to eliminate data and reference to emissions with "no stack emission controls" for power plants.

4. Comment: There are statements in the EIS that 300 elk probably would be lost. The Fortification elk herd between Johnson and Campbell Counties is approximately 30 to 35 miles from any federal coal lease. It seems hard to believe that with no mining activity in the area, the elk would be lost.

Response: The 300 elk include approximately 90 head which reside in the Rochelle Hills. The Rochelle elk are closely situated to the coal outcrop and, all impacts considered, have little chance for survival. The "Fortification" herd is also in serious jeopardy. At the present time federal coal leases are not adjacent to the habitat area; however, there is pending a preference right lease application (federal) which could lead to coal development in the habitat area. Powerline construction is planned through the southern portion of the Fortification elk range and water storage structures are scheduled for placement on the Fortification Creek drainage. If land use planning and management programs consider proper protection to prevent excessive human and industrial disturbance, the Fortification elk herd may survive as a huntable population. If future uses do not consider elk habitat requirements, the herd will most likely be lost as indicated in the draft EIS.

5. Comment: Issue is taken with the fact that it was a regional analysis. The study area of Campbell and Converse Counties cannot be considered as a region.

Response: The basis for selection of the regional analysis area is presented in the Preface, Volume I, second page. The area in Campbell and Converse Counties represents a region from the points enumerated in the preface. It is the area in which the specific applications occur and the area in which the

major companies are planning development over the next 15-years. The impacts generated from development within the two counties were analyzed wherever they occurred within the larger identified 8-county area (Chapter I, Geographic Area Relationship, page I-18.)

6. Comment: Air quality statements are not quite adequate. There is very little discussion of air quality in the region which now in fact is very high.

Response: Additional information has been added to the text of Part I, Chapter IV, Air Quality, to more clearly define current air quality.

7. Comment: On page I-40 the discussion of coal gasification should note its current submarginal economics and its long-term marginal economics.

Response: The purpose of an EIS is to analyze the environmental impact of development of coal resources in the area. Specific applications relating to the gasification plant have not been received and a full analysis of the plant cannot be undertaken.

8. Comment: On Page I-90, Exception to the conclusion that no uranium would be found in the Northern Powder River Basin.

Response: Conclusion is not ". . . that no uranium would be found . . ." but rather that the lithology of the formations appears to be unfavorable for the occurrence of uranium deposits. The sentence has been deleted from the text.

9. Comment: In Volume II, page 542, The impact of the railroad should be separated out of the mines and mills.

Response: The purpose of Part I, the regional analysis, is to assess the

cumulative impact of all known coal-related actions proposed for the study area. Therefore, the impact of the railroad is included along with all the other known and proposed coal developments. The railroad is further analyzed in Part II, Volume III, on its own merits.

10. Comment: In Part VI Wyodak, some of the analysis is limited to 200 acres. Others consider the several thousand acres in the immediately adjacent area, and greater inconsistency is found here than in any other site specific discussion.

Response: The mining and reclamation plan submitted to the U.S. Geological Survey for approval by Wyodak Resources Development Corp. limited the scope of the mining section in that it consisted of a proposal to develop the area adjacent to the south pit, Federal coal lease W-073289, which contains 240 acres. When the coal reserves have been depleted in the south pit, mining will continue on Wyodak's leases north of the power plant, federal coal leases W-0111833 and W-0313666, containing about 1640 acres. The descriptions and impact analyses, therefore, encompassed the entire acreage controlled by Wyodak in the vicinity of their power plant.

11. Comment: There are references to 900 acres of lakes on pages VI-10, -11, and -145. I substantiate these references.

Response: References to lakes were based on information contained in the Mining and Reclamation Plan submitted to U.S. Geological Survey by Wyodak Resources Development Corp. on November 11, 1973. Page VI-11, third paragraph, of the plan contains the following statement: "When mining is completed, the central part of the pits will gradually fill with water and form lakes." The total of 900 acres was estimated on the basis of such physical data as size of area to be mined, number of areas (2) to be mined, thickness of coalbeds, and thickness of overburden.

12. Comment: The suggestion that all the area to be mined should be reclaimed as grazing, as on Page VI-11, is not looking to the long-term development of both industry and ranching in the area. The nearness of population, electric power, waste heat, Interstate Highway, and junction of the rail system indicates some chance for industrial development and that surface should be reclaimed accordingly.

Response: The Statement does not suggest that the area be returned to grazing use but assumes that this may occur. It is agreed that potential for other land use exists, especially in the vicinity of Wyodak Resources Development Corp's. planned mining area. The alternative reclamation objectives as found in Volume II, Chapter VIII, discusses reclamation of mined areas for a variety of land uses.

13. Comment: The Wyodak analysis does not acknowledge the extensive area of burned-out coal, such as Ditto Lake, the railroad right-of-way, Interstate 90, and the U.S. 16 -- and the Powder Corridor goes through the area. All these land uses complicate the mining, and the maps on Page 6 -- Volume VI-66 and Volume VI, Page 72 should have allowed for these factors.

Response: The recoverable reserve tonnage has been adjusted to reflect the estimated loss of coal under the railroad, highways, and areas known not to contain recoverable coal. The generalized maps that were compiled assumed the hypothetical mining of all coal regardless of the presence of surface features or burned-out areas that might in reality preclude stripping of the surface. The text has been modified to explain the assumptions more fully.

14. Comment: There is too little recognition given to the major steps forward taken by the State of Wyoming to protect our environmental resources and the

strong positive planning which is underway not to reduce the socio-economic impacts of the projected development.

Response: The draft report acknowledged that the State of Wyoming has at least three entities which are in some way involved with planning (see Part I, Chapter VI, Land Use Planning Control and Zoning). It was not the purpose of the draft to evaluate the planning effort being undertaken by any federal, state and local agencies. Rather, it was the intent of the cited section to emphasize the need for coordinated planning programs among all the various agencies.

15. Comment: The University of Wyoming should be included on the list of state agencies that obtained the statement.

Response: Concur. The statement was submitted to University of Wyoming and its name will be added to the list in the final statement.

16. Comment: Table 70 in Volume I, Page 457 and Table 71 on Page 458 in Volume I, are mentioned in the text. When percentages are used the size of the sample should be mentioned.

Response: The tables have been corrected to show the sample size.

17. Comment: A statement at the beginning of the glossary indicating the rationale used would be helpful.

Response: An introductory paragraph has been included as part of the glossary as suggested.

18. Comment: The term "infrastructural" is used in the first Volume, and it is not described in the glossary. And the term "productivity" which, to an

ecologist, is a scientific concept, is also used in the first Volume and does not appear in the glossary. These terms should be included in the glossary.

Response: These terms are among a number of additions made to the glossary.

19. Comment: The EIS needs to show how income, lack of housing stock, deterioration of present housing stock combine to force many incoming residents to live in mobile homes, although they might prefer permanent housing. Data currently from Campbell County indicates that most residents of mobile homes would prefer permanent housing if available.

Response: Part I, Chapter V, Socio-Economic Conditions, Housing, Responsiveness of the housing market to predicted housing demand, analyzes how income and the price of new single-family homes, which are within reach economically of only a few, may lead to an increase in the demand for mobile homes.

20. Comment: The statement should cite literature showing the relationship between housing satisfaction and satisfaction with work and community. In other words, how does this effect community solidarity.

Response: Perhaps a relationship between housing satisfaction and community solidarity should exist, however, other variables are present which do not contribute to community harmony. The transient nature of construction workers and the high turnover rate of personnel by their very nature tend to inhibit community solidarity. While housing satisfaction is an important ingredient, it is only one of several which promotes community environment.

21. Comment: The EIS should emphasize that Wyoming has no adequate controls on

the quality of mobile homes sold in the state, and the impact that lack of policy will have on the incoming residents.

Response: Concur. A text change has been made.

22. Comment: Campbell County has recently passed a mobile home subdivision ordinance that will protect incoming residents, at least in reference to the quality of mobile home parks. This ordinance possibly should be included as a mitigating circumstance.

Response: The inclusion of a mobile home subdivision ordinance may contribute to and enhance the quality of mobile home parks and thus the urban environs. There are many other urban planning tools, however, such as zoning, general plans, housing codes, etc., which could embellish the quality of the urban environment. It was not the purpose of this study to identify the methods by which the quality of the urban areas may be improved, but to outline the adverse effects to the urban environment that could result from the development of coal related industry in the Powder River Basin.

23. Comment: The section dealing with the effect of high income and energy related jobs on basic services needs to be expanded, particularly in references to jobs in service industries, such as public assistance and law enforcement, where salaries are set by state statute or by state merit system with no allowance for areas of impact or inflated incomes.

Response: This point is well taken and a text change has been made.

24. Comment: Discussion of the impact of inflation associated with growth on the segment of current population living on fixed incomes, such as disabled and

aged, is missing. Generally, the whole discussion of inflation associated with development is avoided in the EIS and needs to be addressed.

Response: This point is good and a text change has been made.

25. Comment: Population mobility is ignored in the EIS. Currently, the census data and data from the Black Thunder Project indicate a population turnover of 20 to 30 percent in Campbell County. This high rate of turnover implies a great impact on developing community ties, such as solidarity, which might have short and long-term consequences for passing of bond issues. The high degree of population mobility suggests that communities in the impacted area might have to resort to high service bills, such as sewage, water and electric, to operate municipal functions.

Response: An analysis of population mobility and its potential impact upon the area or community social structure and facilities-service requirements was not specifically undertaken. While data from the Black Thunder Project and from company experiences in other areas of Wyoming and the Rocky Mountain region indicate that, in fact, a turnover rate of 20 to 30 percent has been experienced, they do not provide a sufficient analytical or representative base that would enable any defensible generalizations to be stated. The implications are that such a turnover rate will significantly affect such socio-economic variables as solidarity, community identity, willingness to share the burden and incidence of any increased costs, participation in community affairs, etc. Due to the high technology and labor intensive nature of the development program being proposed, it is likely that the turnover rates will be considerably lower than reported in the Black Thunder Project, and could have relatively little net impact. As the regional area matures into a more industrialized, sustained-

state, primary sector of the State of Wyoming economy, it is anticipated that stabilization will cause a lessened turnover.

26. Comment: There is almost no discussion of the growth potential outside of Gillette. However, in the EIS it is assumed that population growth will be distributed from 1970 to 1990 similar to the 1960 to 1970 growth. In other words, a ratio of five to six. Incidentally, this is incorrect in that a good portion of the Gillette growth between 1960 and 1970 was due to annexation. In other words, the city of Gillette annexed approximately a little over a thousand of its population; so the correct growth figure would be only about 55 per cent for the surrounding country. So again if this type of growth occurs, the impact upon the county should be analyzed instead of strictly looking at Gillette, or, say, Douglas.

Response: It is clear that coal related development will lead to an increase in population levels. It is unclear, however, at which centers and areas population will tend to cluster. The draft made assumptions relative to population (Appendix C: Population and Employment Projection Model and Table 44). These assumptions enabled the development of population projections for cities and counties.

27. Comment: In Volume III and IV, both A.R.Co. and Kerr-McGee state that they intend to house approximately 400 workers at Reno Junction. This impact is not really addressed in the statement. How will they provide sewage services? Will this be a trailer park? Will this be planned, or will they allow some sort of scattered growth?

Response: We do not know how this growth will take place, but it is considered a possibility due to the travel distance to Gillette or Douglas.

28. Comment: Transbasin diversion of water is not adequately addressed in the EIS.

Response: Transbasin diversions to import water for coal development are not known. The environmental impact of each of the possible transbasin diversions is beyond the scope of the Environmental Impact Statement. An opposing comment was made by the Wyoming Environmental Institute at the public hearing in Casper which states, "Transbasin diversions are apparently considered outside the scope of the study, though they are mentioned in some detail."

29. Comment: It seems totally inadequate to deal only with the mining operations and a railroad on a specific data level.

Response: As explained in the Preface, Volume I, only certain specific action proposals (4 mining plans, railroad right-of-way) have been filed with the various federal agencies. Until such requests have been filed, they cannot be included in the specific site action. Upon such filing, they will be subject to the requirements of N.E.P.A. which would include analysis of specific site action.

30. Comment: The subject of inadvertent weather modification and climate modification, for the most part, have been ignored in the Impact Study.

Response: Concur that weather modification was not included within the impact statement. Anticipated climate modification is presently based largely on theoretical application of existing knowledge of precipitation mechanisms and earth-atmosphere radiation energy balance and inferred relationships. The possibility of climate modification does exist. A text change indicating this possibility has been made.

31. Comment: To correct the record, Carter Oil Company at North Rawhide now controls all but 200 acres of the block, which is identified in the Impact Statement as "private holdings."

Response: The text has been corrected to reflect the change in amount of surface acres controlled by Carter Oil Company at its North Rawhide Property.

32. Comment: The statement fails to recognize a great deal of real progressive work in terms of reclamation, soil characteristics, soil reseeding that has been done by the University of Wyoming in the immediate area of the mine at Gillette in their experimental farm.

Response: Concur. The research of the University of Wyoming for the improvement of reclamation practice is acknowledged.

33. Comment: An omission of the EIS was the failure to discuss just who the new citizens of the state are likely to be. That's a big question for the people now living here. Concern over just who your new neighbors are going to be, it's very legitimate.

Response: There is no way of predicting the socio-economic and personality profiles of incoming populations in the 1970-1990 time frame. Case studies which examine incoming persons associated with mineral development in other areas (e.g., Rock Springs, Hanna Basin) do not necessarily represent or mean that the Powder River Basin region will experience an influx of similar types of people. Most of the coal companies have expressed great concern as to where they will recruit their future employees and whether or not they will be able to attract and retain an adequate labor force.

34. Comment: The failure of this statement to really analyze the present attitudes and values of Wyoming citizens can't be talked down to a lack of data. Specific studies exist. An Environmental Attitude Survey completed by John Jenkins this spring could have been utilized.

Response: A great number of attitude and value studies have been conducted in the regional area over the past few years. Most of the studies are only survey results and findings with no attempt to formulate any recommendations for programs that would mitigate the adverse impact caused by growth and development upon a given area-community social setting. Furthermore, the sample size of most of the studies was not sufficient to be representative of total population. Also, most surveys are only addressed to present residents of Wyoming and do not cover residents who may be new immigrants to the area as a result of the development program.

In the subject Statement a recent (March 1974) study by the Denver Research Institute on the question of attitudes of residents of Campbell County was used to provide some data on current attitudes. As could be expected the survey results (based on a survey sample size response of 474) were inconclusive.

35. Comment: What will happen if topsoil and disturbed sub-surface soil begin to blow into Nebraska and Kansas so far as disrupting their agriculture?

Response: While it is recognized in the statement that some wind erosion will occur to disturbed areas, less than 10,000 acres of such areas are expected to be disturbed at any one time in the study area. (page I-58 in DES). Potential wind erosion from less than 10,000 acres of disturbed areas is not expected to adversely affect agriculture in the downwind states of Nebraska and Kansas.

36. Comment: Volume I, Page 475, talks about the amount of area to be mined by the year 1990, and then it says that "This will destroy all of the soil characteristics, micro-organisms, and climatic relationships which have been established over a long geologic time span. This certainly is an overstatement that needs some modification. Moving topsoil will not destroy all of the soil characteristics. Certainly, it will not destroy all of the microorganisms, and reference to climatic relationships is unclear.

Response: Concur. The word "destroy" has been changed to "alter."

37. Comment: Volume IV, Page 119, under the section called Reclamation: "Mining five to ten miles from Gillette will impose an inconvenience for those who hunt close to the city. Mining activity will disturb wildlife, affect some access to private land previously hunted, and generally require residents of the area to travel 30 to 40 miles further for hunting."

Based on previous experience, this is an overstatement. Certainly, deer and some antelope inhabit areas that have been mined in the past, and it is doubtful that travel distances for hunting would increase.

Response: The statement was not made to dispute the presence of wildlife on mined areas. The point was that with increased human and industrial activity there would naturally be a need to restrict or prohibit hunting around the lease to protect the workers. This obviously would change some historical use of the area for hunting deer and antelope close to the city (even with private permission from local ranchers).

The distance factor was chosen arbitrarily and is a judgement based on people's desire to get further away from Gillette as the population and industrialization increased. The distance was based upon increasing numbers of low-income workers incapable of traveling great distances with suitable vehicles.

Thirty to forty miles over paved roads and in huntable habitat was judged to be the distance where competition would be minimal.

38. Comment: There is a statement mentioning the mixing and bringing to the surface of toxic materials, such as boron. The present state law requires mapping and burying of such toxic material.

Response: Section 35-502.24(b)(ix) of the Wyoming Environmental Quality Act of 1973 does cover disposal of toxic materials. However, even with such requirements in the reclamation plan, there is still a possibility that some toxic material may go undetected and be placed on or near the surface of mine spoils.

39. Comment: The figures in page I-135 on current emissions for the existing Neil Simpson Station are incorrect.

Response: Concur. Data for Table 7 (Part I, Chapter IV, Air Quality) have been changed to reflect emission data contained in Table E-3 of Appendix E, Environmental Report dated May 1973, provided by Pacific Power and Light Company.

40. Comment: The existing Neil Simpson Station will not be converted to a 330-megawatt plant at the same location as stated on page I-462. Rather, the new plant will be constructed as a separate project by Pacific Power and Black Hills, and then Black Hills will retire its existing Units 1, 3, and 4 at Neil Simpson.

Response: Concur. Changes have been made in Part I, Chapter V, Air Quality, to eliminate reference to "conversion." The Analysis and Assumption section has also been revised to reflect this.

41. Comment: The figures given in the EIS do not reflect proposed retirement of the old units at Neil Simpson, which will result in a net reduction of particulate emissions in the vicinity of Wyodak at 41 percent of current levels after the new plant comes on line.

Response: Concur. Adjustments have been made in the text and tables of Parts I and VI, Air Quality.

42. Comment: Emissions given for the Dave Johnston Plant, both current and future, need revision to reflect the extensive retrofit program now under way.

Response: New data for Dave Johnston, supplied by Pacific Power & Light Company, have been inserted in Part I, Chapters IV and V, Air Quality.

43. Comment: What are the measures and guidelines to insure the quality in the regional environment and public safety?

Response: The mitigating measures as found in Chapter VI, Volume II, provide the legal measures which can be enforced to reduce the adverse impact of the proposed action. The standards as described are set by existing federal or state environmental quality laws. The purpose of the EIS is not to set quality standards, but to predict the environmental consequences of implementing the proposed action. This and other information assists the decision maker in arriving at conclusions and proposing changes in existing laws to further protect the environment.

44. Comment: Not clear whether the statement is covering four mines or fourteen, two counties or eight, industrial employment jobs, total population or service jobs.

Response: The basis for the statement, the amount of development and area

of coverage is explained at the outset of the EIS. This information is contained in the following places: Preface, 2nd page; Chapter I, Volume I, Introduction - Proposed future actions, "At the same time, it was determined that all potential mining of which knowledge was available, or which could be reasonably inferred or projected, would be included in the comprehensive regional analysis (Part I) portion of this present environmental statement, and this has been done."; Chapter I, Geographic Area Relationship explains what the basic study area is and also states, "Certain potential impacts of coal development within the Eastern Powder River Coal Basin are not confined to the study area (i.e., two county area). Considerations of socio-economic conditions, land use controls and constraints, transportation, history, archeology and paleontology, air quality, water resources and climate have been analyzed basinwide and include the eight-county area of Sheridan, Johnson, Natrona, Campbell, Converse, Crook, Weston, and Niobrara Counties,"; Chapter II, Volume I, Assumptions and Analysis Guidelines states, "The following tables were developed, based on projected coal and ancillary developments for the study area, to establish parameters and guidelines for the analysis of cumulative regional impacts." and the table labeled Projected Cumulative Development Data for the Study Area provides the total proposed development of which the impact is analyzed in the impact section; Chapter V, Volume II, Socio-Economic Conditions identifies the methodology of analyzing the socio-economic impacts based on population growth resulting from increased employment.

45. Comment: If the report includes the Dave Johnston plant emissions with the new electrostatic precipitators, it would be very useful to include emissions if they put scrubbers on Units 1, 2 and 3 of Dave Johnston.

Response: Since the retrofit program for the existing Dave Johnston Plant

is not a part of the regional analysis, a comparison of plant emissions with various controls was not compiled.

46. Comment: Is there 85,000 acre-feet of water available in the Platte River for mineral development?

Response: The 85,000 acre-feet of water from the North Platte River shown as a potential water source in Table 9, page I-489 of the DES, is unused and unappropriated water that leaves Wyoming during flood flows and during the nonirrigation season. The development of this water is contingent upon construction of reservoir storage on tributaries to the North Platte River, such as Deer Creek, LaBonte Creek, and Box Elder Creek (see also p. I-54, 262, 264 of the DES). Additional storage could also be supplied by enlargement of Seminoe Reservoir.

The estimate made by the EIS staff of a potential water supply of 85,000 acre-feet per year from the North Platte River is in close agreement with two other studies by different agencies. The Bureau of Reclamation has estimated the unused water of the North Platte to be 79,000 acre-feet per year. The Wyoming Water Planning Program of the State Engineer's Office has estimated that 75,000 acre-feet could be economically developed into a firm supply. The slightly higher figure determined by the EIS staff is based on a higher value being placed on water, which would make it economically feasible to build larger storage structures having more annual carry-over capacity. This would enable more storage of floodwaters during years of high runoff.

47. Comment: Data presented in Table 1 on Page I-647 show amounts of stack

emissions but do not indicate whether these will be from a total of 1,780 MW new production (I-459), or 2,780 MW (I-56), or includes present emissions.

Response: Concur. Changes have been made in Part I, Chapter II, Assumptions and Analysis Guidelines, and in Part I, Chapter V, Air Quality to clarify the number of power plants. Table 1 of Part I, Chapter VII, Air Quality, has been clarified as to source.

48. Comment: The statement includes percentage emissions increase from proposed new pollution sources for the nineteen county area. The result is a relatively small percentage increase. But the statement leaves out the percentage increase from present to future pollution levels in the Powder River Basin. This seems to misrepresent what will happen to the Basin air quality.

Response: Available data on current emissions is limited to totals for the Wyoming Air Quality Control Regions (Casper Region - - 3 counties including Converse, and Wyoming Intrastate Region - - 16 counties including Campbell). While it is recognized that Basin percentage increases would be much greater and a more meaningful comparison, some display of pollution increase estimates was deemed desirable.

49. Comment: Inclusion of carbon dioxide emissions have little meaning since this element is not harmful to human health. Figures in Table 2 (Page I-649) combine carbon dioxide and carbon monoxide which are probably not correct. Also, an increase from 300,000 to 6,000,000 is more than a 185 percent increase.

Response: Concur. Contents of Table 2, Part I, Chapter VII, Air Quality, have been revised and corrected.

50. Comment: An impact not discussed is the cumulative air quality changes

when emissions from power plants (nitrogen oxides) are combined with gasification emissions (hydrocarbons). When nitrogen oxides and hydrocarbons combine with sunshine, they cause photochemical oxidant problems.

Response: A discussion of this impact has been added to Part I, Chapter V, Air Quality.

51. Comment: Air pollution sections do not consider downwind concentrations and effects.

Response: Lack of data and specific site locations precluded compilation of cumulative air pollutant concentrations downwind from the study area as well as the effects from such concentrations.

52. Comment: On pages I-803-804, the impact statement implies on the basis of a 1970 source that scrubbers are not yet feasible. However, at hearings last fall, the Environmental Protection Agency took the position that scrubber technology is available.

Response: Concur. This section has been revised to include the Environmental Protection Agency position taken following its October/November 1973 hearings.

53. Comment: The study team is complemented for recognizing that, "There will be a fifty percent loss in productivity for grazing purposes. This will occur even if the entire area is revegetated." It should go further and recognize a ninety percent plus loss in productivity for most big game, as described in the wildlife section.

Response: The reasoning contained in the Analysis Guidelines section page I-59 that there will be a 50 percent loss in vegetative productivity for grazing

purposes on mined lands is found in the first section of this volume. Because of differences in food habits between big game species and in the seasonal requirements of particular species, it is not considered valid to attempt to arrive at a general percentage figure for loss in forage productivity for big game. The figure of "ninety percent plus" loss for big game was not used in the DES. While losses in habitat value for big game could be in the neighborhood of, or even exceed 90 percent, this loss is not related solely or simply to vegetative production losses although this is a major factor.

54. Comment: Available soil moisture is rightly recognized as a major determining factor in attempts for reclamation and as the present controlling factor on the existing character of the land. (I-78) A chart in volume I (I-125) shows annual precipitation and the evapotranspiration moisture budget. From April to October, evaporation exceeds precipitation by $9\frac{1}{2}$ " at Douglas and Gillette and 12" at Dull Center. What does this mean for establishing any plant cover? In the mitigation section of volume II (I-631), no connection is made with this chart, but there is a weak suggestion that irrigation systems may be necessary during extended dry periods. If the evaporation exceeds the precipitation in the growing season now, will not the situation be aggravated with increased evaporation in unconsolidated spoil piles or in runoff if the soils material compacts and crusts? To what extent will this affect said reclamation potential? And further, if irrigation is established as a necessity, what salts and trace elements will be leached up to the surface or into the streams and ground water? What is an acceptable level for rehabilitation failures and on-site as well as off-site impacts to water

Response: Potential evapotranspiration is based on measurements of evaporation of water from an open surface and represents the maximum amount of water

that can be evaporated under the existing temperature, relative humidity and wind conditions. It is important as a measurement of relative drought conditions when compared to annual precipitation and is important in terms of the water supply and type of vegetation that can be supported. This is not a measurement of soil moisture availability to plants which is more important to establishing vegetation.

A deficit annual precipitation-evapotranspiration moisture budget is typical of semiarid and arid regions of the West, and under such conditions droughts may have a severe effect and could prevent successful establishment of vegetation unless some form of supplemental moisture is made available. Most years establishment of vegetation is successfully accomplished under the prevailing annual precipitation-evapotranspiration moisture budget.

It is disagreed that a formal connection need be made to the annual precipitation-evapotranspiration moisture budget chart since the semiarid climate and moisture availability is an underlying consideration in the mitigating measures necessary for vegetative establishment.

That increased evaporation, compaction and crusting of soils and spoil material will aggravate or reduce available moisture and hence rehabilitation potential is well recognized. There is no information as to what extent this will affect rehabilitation potential, and effects would be highly related to specific soil and spoil characteristics. Several mitigating measures which have been successfully used to reduce and eliminate such effects are discussed in Volume II, Chapter VI. More specifically, these practices are top soiling, mulching, seeding methods and surface manipulation techniques.

Irrigation is not considered as a viable long-term mitigating measure nor an established feature of rehabilitated mined lands within the region. It is considered as a temporary means of insuring seed germination and plant survival

during the period of revegetation, especially when drought conditions are prevalent. It is considered that the irrigation necessary would not be of a sufficient scale and duration to cause significant leaching of salts and trace elements. Availability of irrigation water in mine areas is not anticipated to be sufficient to permit large-scale irrigation.

Rehabilitation failures will occur due to errors and unusual climatic conditions. However, errors can be corrected and more than one attempt may be necessary before success can be achieved; therefore, rehabilitation will be attempted as many times as it takes to achieve success.

55. Comment: According to the impact statement, even abandoned farmlands in the Powder River Basin have only partially recovered. (C-41) A chart in the statement depicts recovery of various plant and shrub species on abandoned farmland (I-506) and on the surface it looks optimistic. But if the reader compares this graph with an explanation in Appendix C, the chart has a very different meaning. When first studied, figure 6 in Chapter V, left the impression that percent figures represented the number of plant species. The explanation in the Appendix gives a whole new perspective - the percent figure represents the amount of cover as well as plant species. This adds impact to the figure and shows that, ". . . after nine years, the total vegetation cover was only slightly over three percent; cover was less than 50 percent of that found on adjacent undisturbed lands." (C-41)

Response: The graph on page I-506 illustrates the percentage of the total vegetative cover (or density) present in each vegetative group. For example, at 24 years about 90 percent of the existing vegetation was perennial grasses, about 5 percent weeds or forbs, 3 percent annual grasses and 2 percent shrubs and semi-shrubs. The graph does not show that "after nine years the total

vegetative cover was only slightly over three percent" or that "cover was less than 50 percent of that found on adjacent undisturbed lands." These statements, taken from Volume V, page C-41 of the DES, are correct, however, and were taken from other portions of the research work from which the graph came.

56. Comment: The impact statement does not talk about what will happen at the lakes. It denies altogether that water quality in aquifers will be affected except locally in the mines.

Response: As stated, it is assumed that water in lakes left from removal of coal could contain several thousand milligrams per liter of dissolved solids (minerals) because of high evaporation rates. Much research is needed regarding the and environmental status of residual lakes.

It is believed that changes in water quality in aquifers will be restricted to local areas of mining. The possibilities of leaching of toxic trace elements from backfill deposits are discussed (page I-499) in the statement.

57. Comment: The impact statement has not given clear understanding or much space to the distribution of selenium or its presence in vegetation and effect on livestock.

Response: Selenium levels in soils and overburden of the study area are not expected to be at concentrations dangerous to livestock, such as found in the Pierre shale. However, analyses of soils and overburden for detection of such dangerous concentrations are required under mitigating measures.

58. Comment: The impact statement does not give me a clear picture of water available in the Campbell-Converse County area or the larger eight-county area.

Response: The amount of water available for development is summarized in

Figure 3, page I-487 and in Table 9, page I-489 of the DES. These summaries present an over-simplified picture of water availability. A more detailed discussion of the water resources of the area is contained on pages I-195 to I-267 of the draft DES. The amounts of water that are physically available from both ground and surface sources, as well as the compact agreements and water rights that govern its use, are discussed in this section.

59. Comment: . . . The effect of water diversions and new storage facilities is not adequately covered.

Response: It is impossible to properly assess the impact of a storage facility or diversion until its location and size have been identified. A number of potential reservoir sites are listed on pages I-263, I-264 of the DES and potential transbasin diversions are described on pages I-266, I-267 of the DES. An assessment of the general impact associated with these works is made on pages I-497 and I-498 of the DES.

60. Comment: On the availability of surface and ground water, the information is inconclusive and confusing. In one place the statement leaves the reader with the impression of water scarcity" . . . during most years only those rights with with a priority dating before 1900 have a dependable water supply during late summer months." (I-258) There is no table to show what this means in terms of acre-feet and the number and location of water rights. What percentage of the rights have a dependable supply? How many water rights and acre-feet are on file after 1900? Where are all these rights located in northeast Wyoming and how would they be affected with new dams and ground water wells? None of this information is given to assess impact.

Response: A description of the unused and unappropriated water for each of

the areas streams is made on pages I-262 to I-266 of the DES. A complete tabulation of all of the water rights in the area can be obtained from the Wyoming State Engineer's Office; however, this material is voluminous, and it was considered better for the purposes of the impact statement to present only a summary of how the water rights affect each stream's water supply.

61. Comment: Not all water rights are located in northeastern Wyoming, and no statement is made to that effect in the impact statement.

Response: A description of the impact of developing water supplies is contained in Vol. II, pages I-485 to I-503 of the draft.

Water rights are located throughout northeastern Wyoming, and a description of possible impacts is contained on page I-501 of the draft.

The assessment of impacts is given in Volume II, Chapter V.

62. Comment: On page I-262, the statement denies some interstate compacts are within the analysis scope of the environmental impact statement and then includes the filings for new reservoirs on one of those rivers. All this conflicts and gives the impression of water availability and denies the need to look at associated impacts.

Response: A complete discussion of the interstate compacts for all streams leaving the state was beyond the scope of this statement. A summary of the agreements for the more important streams of the area was given so the reader could see the problems of developing water supplies; however, a complete description of all the legal implications of each compact would not add to the understanding of environmental assessment.

63. Comment: In the impact chapter, potential water sources include the North Platte River as if it were within the study basin when it actually should be in the Imported Water column along with the Green, Shoshone, Yellowstone, and Wind/Big Horn Rivers.

Response: The waters of the North Platte River would be imported if they were diverted into the Powder River drainage basin; however, the North Platte does flow across the Powder River Structural Basin and across the southern part of the study area. Consequently, the classification of its potential supply may be considered either imported or local.

64. Comment: Using the figures in the statement on "unused and unappropriated water", there is a stated availability of 96,000 acre-feet per year for the Powder River drainage. (I-265) Reservoir filings for the Tongue River total close to 370,000 acre-feet capacity and 790,000 acre-feet capacity for the Powder River drainage (Table 26). Are these applications in excess of the large carry-over storage?

Response: No. However, these reservoirs would provide for users in both Montana and Wyoming: thus, water allocated to both states could be stored.

65. Comment: Surface water availability and needs, presented in the Tables on pages I-53, I-58, I-263-264, I-486, I-487, I-488, and I-489 are confusing. These tables are not drawn together with a clear description of their meaning and impacts. The table on water requirements for the study area on page I-53 evidently goes with I-486 in the impact chapter. But the study area water requirements in the assumption section used for analysis of cumulative regional impacts (I-58) does not seem to fit anywhere and the figures are quite different. None of the tables relate irrigation figures to adjudicated acres or

permits in good standing. "Structural Basin" is not defined to be the eight-county area, northeast Wyoming, or all of eastern Wyoming. There is no understandable comparison between present storage and future storage as they relate to yearly fluctuations, stream flows and evaporation. It is not clear if the Powder River drainage has enough water to cover its needs, where the water is located, and transportation systems needed. What portion of the Tongue River water might go over to the Powder River drainage? How much North Platte water? Some estimate for reclamation water requirements should also be made.

Response: The understanding of water availability is a complex matter, as interstate compacts, Federal and State water rights, ground water-surface water inter-relationships, etc., complicate its physical occurrence. An attempt was made to simplify the subject as much as possible, and to summarize the water-supply figures by tables and graphs.

The "Structural Basin" is shown on Figure 11, Chapter IV, Part I.

It is not known how much if any, water may be imported. Industrial concerns have not yet decided what means - ground water, imported water, etc., may be the most feasible.

66. Comment: Present surface water quality in northeast Wyoming is not described with any clarity or interpreted for reader understanding.

Response: Water quality of streams in northeastern Wyoming is generally proportional to the magnitude of the flow; thus, the higher the discharge, the lower is the dissolved-solids content. However, suspended-sediment concentration increases with discharge. Water that appears to be of suitable quality for one user may be unsuitable for another user, because requirements differ. Most streams in northeastern Wyoming have no flow most of the time.

67. Comment: The 150,000 acre-feet of ground water availability does not seem to have a source in the previous chapter. How was this figure arrived at? On page I-54, this figure is used as the annual recharge rate, but the source of the figures is not stated.

Response: The potential for long-term ground water development was considered to be the amount of recharge to the aquifers. Little data are available concerning recharge rates to the many aquifers in the area. A conservative estimate of 150,000 acre-feet of recharge per year was assumed. Thus, this amount of development should be available for long-term use.

68. Comment: The tables on ground water quality (I-203-207) are not interpreted and they are incomplete on trace and toxic element analysis.

Response: A table "Significance of Chemical and Physical Properties of Natural Waters" along with some explanatory text is now included in the statement. The chemical analyses of water listed on pp. I-203-207 were made over a period of many years for a number of projects at times when only the principal chemical constituents were of primary concern. Consequently, analysis for trace elements was not made. Most analyses of water from areas of potential coal development now include determinations of trace elements.

69. Comment: The water impact section does not discuss in full the water quality or quantity changes that will occur from interrupting aquifers. It does recognize that wells and springs just west of the mining area will probably be dried up, but it has left out entirely the very real possibility that the many wells east of the mining area will also lose their water source.

Response: Impacts on water quantity and water quality from interruption of aquifers were discussed on pages I-492 to 495 of the DES. The full long-term

impacts of interruptions of aquifers are not known, but the impacts are expected to be local. Monitoring by means of observation wells as development progresses will be necessary to evaluate full impacts.

As stated in the EIS, water wells and springs in the vicinity of mining operations could be affected by lowered water levels from mine dewatering. Because the coal and overburden rocks dip generally westward, and thus will not be present east of the mine sites, most of the effects of mine dewatering will be west of the mining operations.

70. Comment: One of the gaps in the statement is that the measurement of coal resources is done on the traditional tonnage basis. There are several other ways that you can measure coal, and it would be very beneficial to include these in the impact statement.

Response: Coal is transported, bought and sold on a tonnage basis. Coal reserves and resources, therefore have been expressed in this impact statement in the traditional manner by tonnage without detailed classification as to sulfur content.

Heat value is considered by power generation utilities, because they have to meet EPA standards for sulfur dioxide (SO₂) emission. These standards equate sulfur content to a common heat value base (one million Btu). The average sulfur content, from lease to lease, ranges between 0.3 to 0.4 percent. Coal from the eastern Powder River Basin, having a heat value between 8000 to 8500 Btu/lb. and less than 0.48 percent sulfur, will meet the EPA standard for emission of 1.2 pounds of SO₂ per million Btu.

Large quantities of eastern and midwestern bituminous coal used for power generation, having 12,000 to 13,000 Btu/lb., usually exceeds 0.72 to 0.78 percent sulfur allowed by EPA standards, although limited amounts of eastern

anthracite meet EPA standards for pure air emissions.

By blending coal having a sulfur content of 0.3 to 0.4 percent with coal having 0.5 to 0.6 percent sulfur, most of the eastern Powder River coals can be utilized in power generation.

71. Comment: One of our most basic concerns is with the toxic and trace elements which are mentioned several times in the statement. No clear idea is given as to what are significant levels of toxicity, or if trace elements exist in the area.

Response: Effects of long-term ingestion of low levels of these elements are poorly understood. Most work on toxicity is based on high-level exposure of short duration on small animals. Extrapolation to humans, therefore, is uncertain.

Known standards for toxic trace elements, whether recommended, allowable, restricted, or permissible, pertain to drinking water as established by the World Health Organization, U.S. Public Health Service or the Federal Water Pollution Control Administration. The presence or amount of toxic trace element serves as a warning of a potential pollutant or contaminant but does not necessarily indicate the level of toxicity. The form of the element, its interrelation with other elements or compounds, and its half life (whether it passes through quickly or accumulates) are all important.

The toxic trace element may occur as an inert form or as a free ion in solution. The amount of an element in soluble form is important, because in this form it can be easily ingested by plants and animals. Information related to trace elements has been added to the section on Quality of Coal in Volume I, I-178a through I-178k. A list of references pertaining to trace elements has been added to the bibliography in the statement.

72. Comment: Leaching and concentration of dangerous trace elements in coal and overburden is often mentioned in discussion about strip mining. Although the tabulations of elements contained in the core samples were interesting, these tables were not interpreted in such a way that the public can ascertain what the effect of toxic materials may be or the possibilities of accumulation of such substances.

The mechanics of sampling all of the overburden and burying problem materials are also confusing.

Response: To our knowledge, information regarding leaching and concentration of toxic trace elements in coal and overburden presently is lacking. Observation wells are being monitored by the mining companies for water quality and trace elements, which constitute baseline data prior to mining operations. Present overburden analyses show an extremely low context of toxic trace metals (molybdenum less than 1.; mercury less than 0.2; selenium less than 0.05; uranium less than 5 see Table 4, III-48. Leaching tests will be conducted to corroborate or refute potential concentration of these minute quantities of trace metals.

73. Comment: Another area which is not presented or discussed in the statement is the significance of the parting seams between the coal beds and the thin shale beds within the coal seams.

Response: Partings including beds of shale, sandstone, etc. only a few inches thick between coal beds, are not mined with the coal. High ash and sulfur contents of the partings, if mixed with the coal, probably would make the mining operation economically and environmentally unfeasible. The six-inch thick sample at the Wyodak mine at Gillette with an ash content of 84.9 percent reported in the table on page I-177 is a shale parting. The parting is not and will not be mined; according to the company's mine plan, it is and will be

buried under overburden spoil returned to the mine pit. Procedures for sampling coal dictate that all thin partings within the sampled interval that are normally mined with coal will be included with the coal sample; unmined partings may be sampled and analyzed separately for information. Any thin shale beds occurring within the coal in sampled intervals as shown in the tables are included with the coal so that the recorded analyses represent the component that is actually mined.

74. Comment: The alternative impacts of exporting the coal resource rather than conversion within Wyoming and transporting the resultant energy should be considered.

Response: Concur. A new alternative labeled "Exportation" has been added to the alternative section Chapter VIII, Volume II.

75. Comment: Impacts of sheep-tight fencing on wildlife have not received adequate attention. The fenced railroad right-of-way in addition to the highway right-of-way fencing parallel to the proposed railroad route will leave a long area in between the two which may be unuseable for antelope. What is the acreage of this area?

There will be a relatively "dead" space between Highway 59 and the proposed route not necessarily void of antelope. Antelope may build up in the area. Because of the proximity of the highway on one side and the railroad on the other, these animals may not be accessible to hunters. This, in effect, removes additional habitat from the area and the end result will be the necessity to remove the animals from that area. This would double the projected losses of antelope due to railroad construction from 75 to 150 head.

Response: The barrier effect of "sheep tight" fence construction along the

railroad was discussed on page II-108 of the statement. The combination of the Highway 59 right-of-way fence and the fencing along the proposed route of the railroad will enclose a long narrow strip of land of about 153,000 acres. Much of the highway fence is already "sheep tight" and with nearly 80 percent of the land crossed by the railroad under private ownership, the majority of the route may well be put under "sheep tight" fence. Where public lands administered by the Forest Service or the Bureau of Land Management are involved, the options of whether or not to make railroad right-of-way passable to antelope remain open. The question here which must be resolved, if the proposed route is used, is will antelope losses due to collisions with trains be more severe than those associated with stoppage of antelope movements by fencing? This question will be resolved, on public land, with appropriate input from the Wyoming Game and Fish Department should the railroad be constructed along the proposed route. If the 153,000 acre area does ultimately become an "antelope tight" pasture, it is quite probable that antelope management in the area will be further complicated. Populations presently using the area may eventually be reduced because of reduction in habitat in the general area if some areas of habitat are rendered useless by isolation or separation of essential components. Should hunter access and harvest be curtailed and habitat conditions within the fenced area are such that the herd could build and become a nuisance, the Wyoming Game and Fish Department may be forced to remove the herd in this area. Considering the information at hand, it appears certain that some additional adverse impacts will be felt either in the form of increased management problems for the Wyoming Game and Fish Department or in the form of some additional reduction in the base antelope populations or both, but the specific kind and degree of impact can only be speculated upon at this time.

76. Comment: Reclamation of mined lands will also require a good deal of semi-permanent fencing which does not seem to have been considered very thoroughly.

Response: The statement that fencing may be required during rehabilitation efforts is very likely correct. Any specifications, locations or amounts of such fencing, is unfortunately purely a matter of speculation at this point. The construction of fences, however permanent, would indeed further complicate the big game management picture in the area.

77. Comment: Rehabilitation of the mined areas to conditions of equal or greater productivity over a long time span does not appear to be possible. How then, is this reconciled with the fact that state law requires that land be restored to equal or greater productivity? Is development to be delayed until techniques for long-term rehabilitation are proven? Is the law ignored? Should it be changed to specify something less than completely self-sustaining systems? Are parcels of land written off here and there as sacrifice areas?

Response: The alternative titled Restrict Development (Delay pending new technology) Chapter VIII, Volume II, examines the impacts of delaying production until additional and better reclamation techniques for semiarid areas are developed and proven. The questions as posed are some of the many faced by the decision maker and the consequences of which (environmental impacts) are portrayed as adequately as possible in the statement.

78. Comment: Mention is made in the individual mining plans of increasing grazing capacities on lands adjacent to the mining areas by improving species composition, increasing water development, fencing and sagebrush eradication.

Impacts of these activities must be considered if they are to be considered mitigating measures.

Response: These types of developments are presented within the document as possible measures for mitigation of impacts for loss of agriculture productivity and would require an environmental assessment if implemented.

79. Comment: The site specific information as compiled by the companies should be included in the impact statement.

Response: All of the companies involved in the area which have ongoing studies have readily made this information available to the impact team. Much of the data which were available were analyzed and included in the statement. Data are continually being developed by the companies and this data collection will continue throughout the life of the project. In developing the impact statement as with all reports, a certain time arrives after which it is not possible to include additional data. Any significant data developed between the time of the draft and development of the final will be analyzed and where appropriate included in the final statement and will be made available for public examination.

80. Comment: Anticipated impacts are included for air pollution, but there is no corresponding discussion of impacts of large-scale water development which will almost certainly be a necessity. Transbasin diversions are apparently considered outside the scope of the study, though they are mentioned in some detail.

Response: We do not know from what geographic area within the Powder River Basin water supplies, if developed, will come, or from what geologic formations this water will be pumped. More than 50 geologic formations representing as much as 20,000 feet of sedimentary strata overlie the basement Precambrian rocks

in the deepest parts of the basin. It is believed that a number of these formations are potentially productive aquifers to be considered for development of water supplies, but to date, these formations have not been adequately tested. Each company must develop its own water supply from the most economical and dependable source within the legal constraints of water rights.

The possibility of minor land subsidence should thick sections of Tertiary-age sand, shale, and clay be dewatered was discussed in the statement.

Graphs were developed showing maximum possible drawdown for given distances and times, assuming a yield and a storage coefficient and are illustrated on page I-494 of the statement. Drawdown is directly proportional to discharge, thus, the drawdown at other pumping rates can be estimated from the graph.

81. Comment: Air pollution from expected development within the study area is tabulated, but the total impact of this pollution, including burning of trace elements, on vegetation, grazing and human health are not well explained.

Response: Lack of information on specific locations for proposed plants precluded compilation of cumulative air pollutant concentrations including trace elements. In addition, little data were available on specific effects of air pollutants on vegetation, animals and humans.

82. Comment: Volume III, Page II-115, contains the statement "All production in these fields would be lost until native species become reestablished, and even then the production would be lowered."

This statement in itself is acceptable if the concern is only with allowing natural revegetation to occur. On the other hand, why not consider reseeding those particular areas, rather than allowing them to return by natural means.

Response: The section of the document referred to is an analysis of impacts

and not a discussion of available mitigating measures. It is agreed that re-seeding these fields with native or introduced species is a viable alternative to natural revegetation; however, replacing existing irrigated vegetation with suitable adapted species cannot be required of the landowner. It was assumed for the purposes of analysis that natural revegetation may be allowed to occur on these farm lands if irrigation was removed.

83. Comment: From Volume IV, page 131, "The loss of vegetation on land disturbed by coal mining and related activities will be mitigated by satisfactory revegetation. Initial measures will be started within one year following the reshaping of the land and replacing of topsoil. Revegetation efforts will continue until a satisfactory stand of vegetation is established that will grow without irrigation."

The question relates to the one year starting reclamation period which is out of place in an Environmental Impact Statement.

Response: It is agreed that this requirement may in some instances be too restrictive in plans for the rehabilitation of the mined areas and some flexibility would be desirable. However, revegetation, to provide protection against erosion, loss of productive features such as viable topsoil and provide mitigation for the secondary impacts of water and air quality, should be accomplished as soon as topsoiling and topographic shaping is completed. It is also agreed that some spoil materials may be sterile and require aging or weathering prior to rehabilitation. Spoil materials that are detrimental to plant growth are to be segregated and buried so as not to become a problem to rehabilitation efforts.

84. Comment: In Volume IV, page 140, "Denuded areas will be mulched and disced on the contour pattern to reduce runoff, erosion, and sedimentation. Adequate mulching will be maintained until revegetation specifications have been met."

This is an area more logically contained in some other document or some other province than in an environmental impact statement.

Mulching may or may not be a desirable practice, just as pitting or some other means of maintaining moisture in these areas might also be a very desirable practice. But the practice should be designed for the specific area involved which is a principal objection to the statement.

Response: It is agreed that the practices should be designed and applied for the specific areas and soil conditions encountered. These practices are discussed more thoroughly in Volume II, Chapter VI. The text will be revised to present the general requirements.

85. Comment: In Volume IV, page 141, states, "Prepared spoil areas will be seeded with recommended seeding mixtures. Seed will be drilled into the soil to a depth of one-half to three-fourths inch and on a contour pattern. Two years shall be a proper interval to determine if an adequate stand has been established. Two tries to establish an adequate stand will be considered adequate. Two years after an adequate stand of vegetation has been realized, the fences will be removed, and the area made available for livestock grazing. This conclusion does not belong in this particular document.

Response: It is agreed that these requirements are too restrictive as contained in the document to allow the flexibility that would be desirable during rehabilitation efforts. The text will be revised to present general requirements.

86. Comment: On page IV-151, in discussing plant succession, reclaiming by reseeding adaptive species is ruled out.

Response: Reseeding with adaptive species is considered in the mitigating measures. However, in assessing unavoidable adverse effects, the present vegetation community will be lost during mining and would not be expected to replace the reseeded adaptive species for 50 years or more following reclamation.

87. Comment: In view of the proposed use of the water from the planned ETSI coal slurry pipeline, the following statement should be deleted: "Disposition of the highly polluted water would create significant impacts at the pipeline terminal. One alternative is to return the water via a separate pipeline to the basin for reuse; otherwise, the used water will have to be disposed of at the point of coal delivery."

Response: Concur. The statement has been revised.

87. Comment: More attention needs to be placed on getting good estimates of the actual population growth and its consequences. Sudden unexpected population growth has been a major cause of deterioration of the human environment in this state. Recent experience has been that some of the estimates of population growth made are quite unreliable.

In this context it is disappointing that the team drafting the Impact Statement has not made more use of the work done by the University of Wyoming study team on the population impacts of the proposed A.R.Co. developments.

Response: Sudden population growth has been a major cause of deterioration of the human environment in this state. Preparing agencies did make use of the work done by the University of Wyoming study team on the population impacts of the proposed A.R.Co. developments. First of all, the A.R.Co. project is just

one of many projects proposed and can't logically be taken to represent the total of all impacts. Secondly, the impact analysis is based on the population projections provided by the University of Wyoming, Water Resources Research Institute, based on the total regional development indicated in the Assumption and Analysis Guidelines, Part I, Chapter II.

89. Comment: Considerable further work is needed on water availability. Table 9, page I-489 of Volume II lists possible water sources available from current unused and unappropriated supplies. No documentation is presented for this list.

Response: The figures in Table 9, page I-489, Volume II, are based mostly on material that was presented in Volume I. For example, the development of surface water supplies is a summary of pages I-262 to 265. The imported water figures are a summary of pages I-266 to 267.

90. Comment: The Federal Report also fails to recognize that there are state and federal air and water quality laws, as well as land laws, under the Wyoming EQA.

Response: The report recognizes both federal and state environmental quality laws in the section beginning on page I-7. Specific references are found on pages I-11, I-12, I-13, I-617 and I-621a.

91. Comment: Observations (temperature soundings) suggest that there would be one episode (stagnation-episode) each year of the duration of approximately six months. That is, there will be an inversion over the area during most of the

winter and most of each spring. So a rather persistent inversion in the winter-time deserves considerable consideration.

Response: Concur. Reference to these observations on inversion frequency have been added to Part I, Chapters IV, V and VII, Air Quality.

92. Comment: Many more analyses of the overburden should be made; so that areas with high concentrations of toxic elements can be located, and measures can be taken to prevent these elements from being released to the environment. In A.R.Co.'s current drilling program, the overburden is being discarded and not retained for analysis. The plan suggests that this is true of all the mine sites and that the overburden could be retained; and therefore, prevent having to do redrilling for this problem later on.

Response: Sufficient trace element base line data presently exists for overburden and coal. In order to avoid contamination from drilling, trace elements in overburden and coal can be monitored by sampling during mining operations, if deemed necessary.

93. Comment: Page IV 111-118 does not really make the point that pumping water from the pit into Little Thunder Creek will raise the salinity of the creek and will probably make the water downstream from the mine unsuitable for livestock or wildlife use.

Response: As is explained on page I-617, the Wyoming Environmental Quality Act of 1973 empowers the Wyoming Department of Environmental Quality, Water Quality Division, to enforce water quality standards. Even if the water pumped from the pit is saline, the act prohibits, except when authorized by a permit, any discharge which would cause alteration of the physical, chemical, radiological, biological or bacteriological properties of any waters of the state.

Before issuing a permit for disposal of any waste capable of causing pollution, the Division must consider the character and degree of injury to the health and well being of the people, animals, wildlife, and plant life affected.

93. Comment: Item Three, on Page 111 and 130, states that irrigation will be used, if necessary, to reestablish vegetation; but the proposed source of irrigation water is not mentioned. In view of its salinity and sodium content, the suitability of the local groundwater for irrigation is questionable. Whether or not the water is completely unusable is outside our field of competence.

The Impact Statement should be more specific as to the feasibility of irrigation, particularly since irrigation is likely to be needed only in the event of a general drought at which time other demands for water will be high and supplies will be at a minimum.

Response: The subject paragraph states that the Forest Service will consider and use supplemental measures to aid revegetation when needed. The feasibility of irrigation cannot be determined until we have better data on water quality and quantity at the mine site. Irrigation is only one of many supplemental measures that will be considered for reclamation of the mined lands.

95. Comment: The Impact Statement should discuss the problem of acid rain resulting from sodium dioxide released from generating and gasification plants.

Response: Concur. A brief discussion on the possibility of sulfur dioxide (transcript shows "sodium" dioxide which is probably an error) contributing to acid rain has been added to Part I, Chapter V, Air Quality.

96. Comment: In two places, the population estimates in the statement are

probably producing figures that may be from one-third to one-half low in a period from 1975 to 1980.

Response: The model used for the population projections was one developed by the University of Wyoming, Water Resources Research Institute, and used for the Northern Great Plains Resource Program population projections. Without additional verification, it is not appropriate at this time to abandon one projection model in favor of another.

97. Comment: The EIS should consider or at least mention additional developments over and above the ones discussed and analyzed.

Response: Depending on who is contacted, everyone has a different picture of potential development which may or may not take place. The developments as analyzed in the statement are based on known company plans through the year 1990. Rationale for these projections are contained in Chapter II, Volume I. In addition, each company which was known to hold interests in the area was sent a questionnaire as to what its proposed plans were and what year it expected to begin implementation. Many of the rumored additional developments, i.e., 4 to 5 gasification plants, did not show up in these questionnaires as returned by the companies and therefore are not included in the analysis.

98. Comment: The analysis in the statement following extrapolation of figures was almost nonexistent; and if analyzed will give an example using doctors in Gillette. It is one thing to simply say that Gillette needs 25 doctors. It's another to analyze what it means in the way of a problem for Gillette to recruit 25 doctors by the year 1980. First of all, the statement says that Gillette has seven doctors. They don't. They only have five doctors.

Response: The impact statement cannot, nor is it intended, to solve all of

the various environmental and socio-economic problems expected to result from coal resource development. Shortages of doctors, teachers and more are adequately pointed out in the statement. And it is anticipated that state and local governments, based upon the EIS analysis, will recognize the need for early planning in order to meet expected demands imposed by an expanding economy.

99. Comment: Reference is made to Carter's plans for recruiting and training residents of Wyoming and adjacent states for employment in the company's Gillette operations. These plans are important and should be considered a matter of record because they constitute what must be considered a beneficial impact of coal development on residents who seek a wide choice of jobs for themselves and their children within Wyoming.

Response: Specifically, Carter's plans to recruit and train residents of Wyoming and adjacent states is indeed a beneficial impact both to the company and to the residents. However, this beneficial impact has already been alluded to in Part I, Chapter V, Employment.

100. Comment: The impact statement gives the impression that the total development is unavoidable. The production of energy and a reasonable use of energy should be considered.

Response: The impact statement does not attempt to portray that the proposed development is unavoidable. The unavoidable impact section, Chapter VII, Volume II, portrays the adverse environmental impacts which cannot be avoided if the development is allowed to occur. This provides information to the decision maker as to what the possible environmental consequences may be if he allows development to occur. Chapter VIII, Volume II analyzes the impacts and alternate

means of producing the required energy, including alternatives of energy conservation and other energy sources.

101. Comment: The utilization of the coal reserves or coal supplies in some of the states that already have coal mining should be looked into further.

Response: Chapter VIII, Volume II, examines various alternatives to the production of coal in the Eastern Powder River Coal Basin of Wyoming: No New Development - Control location of depletion by designating area for production, and Alternative Sources of Energy--Coal (Nationwide). These alternatives examine development of coal in other areas outside of Wyoming.

102. Comment: The five site specific analyses included in this Statement are adequate. The final EIS should include the following site specific information:

1. A comprehensive survey of the seasonal abundance, distributions, and movement of wildlife correlated with vegetative, hydrographic and topographic surveys of the site and attendant sphere of influence.
2. A quantitative analysis of all probable impacts on each wildlife species resulting from the proposed development.
3. It should include a detailed description of the proposed program to mitigate and or compensate for the projected wildlife losses. Proposals for public access for management, utilization and enjoyment of wildlife should be included.

Response: Much of the detailed site information alluded to does not presently exist. Most of the reliable data available are more applicable to broader areas such as discussed in the regional portion of the statement. The bulk of the information which is applicable to specific development sites has been considered in the statement. In order to refine the site specific analyses

to a much higher degree, the results of additional field research would have to be obtained. Some of this type of research is underway; some is being proposed; and some is not yet being considered. It may require several years to acquire the desirable level of information for all species on all sites.

The statement assumes the position that only mitigation of fish and wildlife losses which can be assured by legal or regulatory means can be discussed. With the high predominance of company-owned lands involved, mitigation of wildlife losses or provisions for use and enjoyment of the wildlife resource on these lands to the degree which may be desirable is not at all legally assured. It could be construed as misleading to the public to develop elaborate proposed mitigation programs which might be implemented. This is not to infer that significant efforts to mitigate losses or enhance the status of certain species will not be undertaken through the cooperation of various companies, the land management agencies, individuals and the Wyoming Game and Fish Department. Such programs will undoubtedly be undertaken but the type and degree of such programs remains to be seen.

103. Comment: Separate environmental impact statements be prepared for each of the five proposed developments as the necessary information becomes available.

Response: Parts II-VI of this statement are in effect separate statements on the five specific developments which address the more localized impacts anticipated from these actions. The broader cumulative impacts are incorporated into the Part I analysis. Each part follows and contains the information as required by NEPA and CEQ guidelines. They contain all of the information which was available at the time of preparation. They also point out the data gaps which are present. Based on this analysis, it is up to the decision maker to

determine if sufficient information is available to make the decision to allow development at this time.

104. Comment: The D.E.S. contends in Volume IV, page 154, that destruction of 5,241 acres of habitat will reduce the carrying capacity of wildlife habitat in the area of Carter's mine. I would like to stress that 5,241 acres of wildlife habitat will not be destroyed. The land can and will be revegetated as mining progresses to satisfy the needs of deer, antelope and any other wildlife.

Response: Clarification is needed. The statement does not contend that 5,241 acres of habitat will be premanently destroyed. This acreage will be initially destroyed with permanent removal involving 845 acres as stated on the above mentioned page.

Reduction of carrying capacity will occur. The degree of reduction will depend on individual habitat requirements of species involved and character, composition and amount of reclaimed habitat which will be available at any particular time. There is, however, no research or evidence which is presently available, which suggests that needs of deer, antelope, or any other species of terrestrial wildlife can be completely satisfied through reclamation efforts.

105. Comment: Observations at the Highland Mine where antelope and deer continuously graze on revegetated land less than 500 feet from the mine area and the common occurrence of antelope along major or interstate highways indicate that antelope will not be driven from or seriously impacted on lands adjacent to our mining block.

Response: As pointed out, deer and antelope will readily utilize most habitat types during certain periods of the year. Species such as deer and antelope which rely on presence of a shrub component in their habitat experience

habitat deterioration with the removal of such shrubs. The displacement concept associated with increased stress as well as actual physical habitat removal often results in subtle population changes.

106. Comment: Page 463 of Part I, states, "The most serious impacts of stack emissions would likely occur within 10 to 20 miles of the plant sites." This is an understatement of the problems that will arise.

Response: Lack of specific locations for projected power and gasification plants precluded compilation of cumulative concentrations of emission pollutants. Therefore, the assumption that a 10- to 20-mile limit from emission sources was most critical was based on estimated maximum concentrations of pollutants occurring within this range of each plant. Beyond that distance, dispersion of pollutants would be expected, thereby reducing ground level concentrations.

107. Comment: Dealing with another indication of the study, on Page 559 of Part I, the statement says, "that from 1970 to 1990 population in Johnson County will increase by 32.5 per cent to about 7400." It also states that the "population growth between 1970 and 1990 for the counties of Crook, Sheridan, and Weston will be stable and inconsequential."

Although the Draft Environmental Impact Statement is not supposed to be dealing with the development in the western part of the Powder River Basin, the wisdom of not taking into account the projected growth in Sheridan and Johnson Counties from the development there is questioned. Mountain Bell has projected populations of 26,000 in Johnson and 80,000 in Sheridan County by 1990.

Response: This statement considers coal related development in Campbell and Converse Counties. Thus, any impact on Johnson and Sheridan Counties as a result of coal related development within their boundaries is outside the intended scope of this study.

108. Comment: The depth and extent of Atlantic Richfield's reclamation, rehabilitation and overall environmental consideration plans are not fully described in Part III of Volume III which deals with the proposed Black Thunder Mine. The company wishes to expand on this information with the work done so far.

Response: The detail on Atlantic Richfield's reclamation, rehabilitation and overall environmental considerations contained in the draft statement were based on the initial mining and reclamation plans submitted by the company. Additional information was submitted on June 10, 1974, in the form of a revised mining and reclamation plan and to the extent possible, this information has now been incorporated.

109. Comment: The Draft Statement does not fully represent the extensive community development efforts Atlantic Richfield and others have under way to control and mitigate to the maximum extent possible the socio-economic impacts anticipated with the development of the several mines expected to be built in this area.

Response: For the same reason the statement does not evaluate the planning programs being initiated by the state, it is inadvisable to comment on the merits (or lack of merit) of any number of possible community development programs initiated by private industry.

110. Comment: . . . The quality of life in Campbell County and also the community's Parks and Recreation System in Campbell County should be addressed.

Response: Concur. The text has been revised.

111. Comment: The mitigating measures section on wildlife dealing with the A.R.Co. Mine and the Jacobs Ranch Mine on the Kerr-McGee lease states: "The

primary impact of habitat loss will be mitigated by increasing wildlife carrying capacity ahead of mining on areas adjacent to the lease. This will be accomplished by measures, such as, providing wildlife cover, providing vegetative species -- improving vegetative species composition, and providing water development." This statement is found on Page III-138 and again on V-134.

On the following page mitigating measures for the impact upon livestock grazing state: "The impact of grazing, both temporary and permanent, will be mitigated. For example, more intensive grazing on or adjacent to the lease area should be accommodated by improving species composition, increasing water development, fencing, and sagebrush eradication." This is found on Page III-140, V-34.

As antelope is the major big game species in the area of these mines, the suggestions of sagebrush spraying and increased fencing are in direct conflict with those to improve wildlife habitat. Perhaps, what is meant is that some habitat can be improved for wildlife and some for livestock, but this is not stated. Certainly, the impact upon wildlife and livestock cannot both be totally mitigated as it appears as being stated in the Report.

Response: It was the intention of the report that some range would be improved for wildlife, some for livestock, but there is no way that intensive management could mitigate the total that will be affected by mining and facilities.

112. Comment: In the same section on wildlife, it is suggested that wildlife that does not move out of the mine area by themselves can be trapped and transplanted, thus preserving the individuals. This statement is found on Page III-138 and V-134.

The Wyoming Game and Fish Department would consider such actions and, if feasible, would cooperate and assist; but the suggestion is unrealistic and, in most cases, would be impractical.

Response: Concur. The paragraph has been deleted from both the A.R.Co. and Kerr-McGee reports.

WRITTEN COMMENTS AND RESPONSES

LETTER COMMENTS

1. Niobrara County Board of County Commissioners

No response required.

2. Geothermal Energy Institute

Comment: A summary of program alternatives and their assessment should be included in the Introduction of the DES.

Response: The DES and FES contain a summary sheet at the beginning of the document which lists those alternatives which were considered and analyzed. Chapter VIII of Part I examines each of the alternatives in detail. These are the reasonable alternatives to the proposed action.

Comment: It is entirely inaccurate to say that "Geothermal resources that can be commercially exploited in the U.S. at the Geysers, California" (p. 817).

Response: The Text, p. I-817, has been changed to reflect that the critical parameter in this discussion is the exploitation of geothermal resources to generate electric power.

Comment: The geothermal potential of the Geysers is estimated at 5,000 - 8,000 MW by Dr. Giancarlo Facca, a recognized geothermal authority and contrasts with the 1300-2000 MW figure usually given for the present area in production.

Response: It is true the potential of the area may be 5,000 - 8,000 MW, however the 1300 - 2000 MW figure used is the figure for the currently producing area.

Comment: We disagree with the undocumented opinion at page I-817 that unspecified "technical and economic constraints" will permit geothermal energy to constitute a major energy source.

Response: Page I-817 has been revised to reflect the probability that geothermal resources cannot fill the national energy need during the 1974-1985 time interval.

Comment: The DES is seriously inadequate in failing to assess the environment impacts of different fuel cycles, such a comparison, we submit favors geothermal cycles over nuclear and fossil fuel cycles. We are enclosing a copy of Bowen's analysis in this regard for your information.

Response: No disagreement exists that a "geothermal cycle" can be environmentally more desirable than some other "fuel cycles". However, the environmental impact through time must be assessed on the total energy systems which are utilized to satisfy some part of the national power demand.

Comment: This section (p. I-489) of the DES, however, does not document the calculations of annual water requirements at pages I-486-7 for review.

Response: Impacts were analyzed for three time periods (Chapter II, Part I, Item 1). The long time span (1975-1990) prevented analysis on a yearly basis. Water requirements on an acre-feet per year basis at 1980, 1985 and 1990 are shown in a table in the above named chapter.

Comment: The environmental analysis of air quality impact from coal power plants is inadequate in that it fails to assess the impact of radionuclide emissions produced by coal combustion.

Response: To the extent of available information, air quality impact sections for Parts I and VI have been expanded to consider radionuclide emissions.

Comment: The discussion of the uranium resource base is inadequate. It

does not sufficiently make clear that reserve figures include speculative estimates of reserves, page I-809.

Response: The degree of speculation involved in the quantities of U_3O_8 stated on page I-808 is defined in two ways. First, the cost per pound of production indicates that reserves producible at a higher price are necessarily more speculative than those producible at a lower price, e.g. the price of production now. Secondly, the existence of a resource is by definition more speculative than the existence of a reserve because the resource base by definition includes much more nuclear-bearing material than the reserves.

3. Middle South Utilities

No response required.

4. Bob Rourke

No response required.

5. Homer A. Robinson

Comment: The statement does not indicate the amount of coal to be mined in Colorado, Nebraska, Montana and North and South Dakota.

Response: The purpose of the EIS as explained in the preface is to examine the potential environmental impacts of the proposed action which, in this case, is the development of the coal resources in the Eastern Powder River Coal Basin. Wyoming.

Comment: The report does not speak to coal exports from the United States which amounts to about 53 million tons annually, more than the amount proposed to be mined in the Basin.

Response: As stated in Chapter II, Part I, assumption and analysis guidelines, the projected production in the Basin will reach 62 million tons per

year by 1978 and 150 million tons per year by 1990. Coal presently being exported from the U.S. is for metallurgical use. Subbituminous "C" coal, such as that found in the Powder River Basin is excellent for power generation within the U.S. Therefore, restricting export of coal as an alternative to development of Powder River coal is not feasible as it represents different uses and types of coal.

6. Central Louisiana Electric Company

No response required.

7. Thomas E. Horobik

The only comment presented in this letter was answered under letter 2.

8. U.S.D.A., Forest Service, Rocky Mountain Forest and Range Experiment Station

Comment: (Page III-103) While mining will doubtless cause disturbance of soils on the mined area, it is unlikely to result in destruction of all soil properties. Experience has shown replacement of topsoil on mine spoils usually provides a satisfactory medium for successful plant establishment even though some structure is lost and there is mixing of horizons, which in the dry plains environment are often not well defined.

Response: Statement of page III-103 refers to destruction of soil characteristics such as arrangement of existing soil horizons which are the result of pedogenic development. Statement is not referring to destruction of topsoil and all soil characteristics. This has been clarified in the FES.

Comment: Portrayed impacts on wildlife from proposed mining activities seem to be unnecessarily bleak. It seems improbable that 6,500 acres of habitat will be destroyed if reclamation occurs as planned. In fact it would seem that

habitat would actually be improved with successful reclamation, due to increased diversity.

Observations at the Amax Belle Ayre Mine have shown antelope and deer to be only minimally disturbed by the mining activity.

It is questionable that elk will be so disturbed as to be forced from their habitat.

It is doubtful that strip mined areas cannot be satisfactorily revegetated with vegetation that will satisfy at least a portion of the needs of deer and antelope.

Response: Habitat destruction will result where strip mining occurs. There is a difference between permanent loss and losses which may be mitigated to some degree through reclamation efforts. Reclamation efforts will be designed to restore livestock forage primarily involving a grassland ecosystem. A possible exception is the Thunder Basin Grasslands where desired land use objectives may include the establishment of shrub species on certain land forms. In the absence of the shrub component, dependent species of wildlife (e.g., deer, antelope, sage grouse) will realize severe habitat damage.

Antelope and deer observations unless specifically correlated to total population levels, seasons of use and distribution have limited utility when attempting to assess overall impacts. The displacement concept in conjunction with habitat occupied at or near carrying capacity is often misunderstood.

The southern portion of the "Rochelle" elk herd falls directly adjacent to the A.R.Co. lease area. Primary habitat areas parallel the coal outcrop. Based on available literature and information, statements regarding probable impacts on elk (III-117) still appear to be a reasonable estimate.

No acceptable research or information exists which would suggest satisfactory habitat reclamation is currently probable for wildlife species dependent upon shrubs for all or part of their life cycles.

Comment: The statement on page III-148 that a 50 percent loss in productivity will result even on successfully reclaimed areas does not seem justified without supporting evidence. We recognize that this is one of the Analysis Guidelines under which the EIS was prepared; however, where it is stated on page II-148 it appears to be fact.

Response: This assumption as presented on page III-148 is changed to read as follows: Even on areas that are successfully reclaimed, a 50 percent loss in productivity is projected, based on the assumptions and analysis guidelines contained in Part I, Chapter II.

9. Otis L. Copeland

Comment: Volume I, page I-438, Table 63. I feel certain the unit in the last column should be square miles rather than acres.

Response: Table 63 has been corrected.

Comment: Volume II, page I-523. The general observations concerning the nature of the vegetative cover which will be established appear tenuous and unsubstantiated.

Response: Details concerning the establishment and nature of the vegetative cover are covered in Part II-VI of the EIS.

Comment: Volume II, page I-593, last paragraph. Reference to a possible increase in the number of unwed mothers is sheer speculation, and -- in my opinion -- has no place in such a report.

Response: The reference to unwed mothers has been deleted.

Comment: Volume II, page I-622 and elsewhere. What is preplanning? It's really planning.

Response: Agree that the preplanning is really planning. However, the

contextual meaning within the document is to convey that rehabilitation should be planned in advance of the actual mining and not as an afterthought.

Comment: Volume II, page I-627. Listering? Should it be listing?

Response: The spelling is listing and the text has been corrected.

Comment: Volume II, pages I-627-633. These pages reflect not only an analysis, but include prescriptions, requirements, etc. They mix apples and oranges.

Response: Agree that this section contains analysis, prescriptions, and requirements. These are included to provide continuity within this section and are designed to describe the anticipated problem, the prescription, and what generally can be required of the companies towards rehabilitation of mined lands.

Comment: (page I-655, paragraph 3) On what basis is the flat prediction of 50 years of plant succession required? May be much more or somewhat less.

Response: Statement on page I-655 is "Fifty years or more of plant succession will be required for these areas to return to their present state as the existing soil structure and microclimate have been changed and altered."

Prediction of 50 years or more is made from observation of fields cultivated in the 1930's. These fields were seeded to crested wheatgrass approximately 40-45 years ago. They currently have advanced to a point where the vegetative composition is quite similar to adjacent undisturbed areas. The present vegetative composition of the cultivated fields is 5-10% crested wheatgrass with the balance consisting of cactus, sagebrush, western wheatgrass, needleandthread, Junegrass, bluegrama, sedges and forbs.

Comment: Beginning page I-707, this entire section seems almost irrelevant

to me. Why do the alternative sources of energy deserve such a play in this report for such a localized area considering coal.

Response: Alternative energy sources are included in the report since both the National Environmental Policy Act of 1969 and the Council on Environmental Quality's guidelines (40 CFR Part 1500) require an examination and discussion of all reasonable alternatives. Although development of alternative sources at one level may complement Wyoming coal, greater levels of development could substitute for that coal. In addition, although the statement discusses coal development in Campbell and Converse counties, that coal will be utilized principally in the midwest - from the Lake States to the Gulf of Mexico. Wyoming coal, therefore, is considered a national energy source and the alternatives are examined in that context.

Comment: I question the appropriateness of including such minute details of the mining operation, down to and including specific pieces, models, and sizes of equipment on hand and that likely to be needed. Some of this material, borders on proprietary information.

Response: The intention is that the document be as complete as possible in all respects in order to assess impacts of the operation. The information utilized is available in the mining plans filed by the applicant, which are public documents.

Comment: Why consider nonviable alternatives? For example, in-situ production of gas is not even perfected - - yet a lengthy treatment is repetitively given it. The same applies to auger mining.

Response: With thick coalbeds close to the surface most mining methods, other than surface extraction, could be placed in a nonviable category. They are discussed in this statement so that the reader can see what extraction options are even remotely possible.

Comment: It is my opinion that to inject a projection of fatalities associated with a given life expectancy of a mine or a total production, is going entirely too far - verging on the ridiculous.

Response: This type of projection is located in the irreversible and irretrievable commitment section of the EIS. It is a known fact that deaths will occur. The projection is based on a known fatality record in strip mining operations. These fatalities must be predicted if the project is allowed to proceed since they involve commitment of a resource, the human resource.

10. Barbara Gilfillan

No response required.

11. Department of Health, Education and Welfare

No response required.

12. Getty Oil Company

No response required.

13. Faye L. Hart

No response required.

14. John E. Mooney

No response required.

15. R. Marriner Orum

No response required.

16. Panhandle Eastern Pipeline Company

Comment: When speaking of impacts on air quality, conclusions about effects on health, visibility, etc., cannot be drawn from emission statistics alone. The emissions must be related to air quality in some analytical or empirical manner. This step would appear to be out of the scope of the statement since none of the plants are considered as site specific projects. Therefore, quantitative statements about detrimental effects of emissions are not properly justified.

Response: While it is not possible to predict pollutant concentrations of emissions at the regional level, it is deemed desirable to quantify the magnitude of potential increases of emissions in the study area.

Comment: On page I-100, there is the reference that nonsaleable by-products will require adequate storage facilities. This is not quite a correct statement because we have determined that all by-products currently have a ready market. This determination is based on market surveys and direct inquiries from potential purchasers and includes all liquid hydrocarbon products, ammonia and sulfur.

Response: As indicated within the statement: "Apparently there is a ready market for all by-products except sulfur," this was not intended to imply that there is not an available market for sulfur; however, the current supply of sulfur and sulfur products available within the United States is more than adequate to meet current demands. This is due partly to the large amounts of sulfur being recovered as a by-product from sour natural gases, refining of petroleum and recovery from other fuels in order to meet air quality standards. It is anticipated that the market may be limited to local use. The marketability of sulfur can be increased if converted to sulfuric acid which has a wide range of uses by industry.

Comment: Table 1, page I-464, shows carbon dioxide emissions for gasification plants but not for power plants.

Response: This was in error. The carbon dioxide emission data has been removed from the subject table.

Comment: On page I-706 the reference to 13,000 acres occupied by gasification plants appears high. The 1,000 acres per plant quoted on the previous page would give a total of 2,000 acres for the two plants considered in the draft statement.

Response: This statement appears in the alternative section under alternate utilization methods. The purpose of this alternative is an examination of the possible impacts if all the coal to be mined was used in gasification plants instead of being shipped by rail line. The 13,000 acres refers to the acreage occupied by the 13 plants it would take to utilize the full amount of coal expected to be produced (see second paragraph of the first page of this alternative).

17. Southwestern Public Service Company

No response required.

18. National Park Service, Rocky Mountain Regional Office

Comment: We note that there is no reference to Natural Landmarks in the Draft Environmental Statement. The National Environmental Policy Act of 1969, Section 101 (b)(4) states that one objective is to "preserve important *** natural aspects of our national heritage***." All Federal Agencies should take cognizance of the sites included in the National Registry of Natural Landmarks to fulfill the intent of Section 102 of this legislation. We site authority

because Land Creek Fossil Area is a registered Natural Landmark in the near vicinity of proposed developments and must be protected.

Response: On page I-355 of the DES, two potential natural landmarks (Pumpkin Buttes and Rozet Escarpment) were identified but the report did overlook the Lance Creek Fossil Area, a registered area. The significance of this area is related to a siting of dinosaur related fossils near the town of Lance Creek. The potential for the natural landmark extends throughout the Wasatch and Fort Union Formation. The Lance Creek site is 25 miles east of any strippable coal deposits.

The FES has been revised to include Missouri Buttes, Inyan Kara Mountain, Hat Creek Breaks and Sundance Mountain.

Comment: The Final Environmental Statement should reflect consultation with the Federal Register for February 19, 1974, and all succeeding monthly supplements in which the complete listing of sites on the National Register is published. In addition to the historical sites listed within the limits of the project area, there is one additional site which should be cited. This was entered upon the National Register February 12, 1974, and is Big Goose Creek Buffalo Jump, Sheridan County, Wyoming. Any sites affected by project developments will require compliance with Section 106 of the National Historic Preservation Act of 1966 (P.L. 89-665) and with the Advisory Council on Historic Preservation's "Procedures for the Protection of Historic and Cultural Properties."

Response: This statement has been added to both Archeology and History, Part I, with the Big Goose Creek Buffalo Jump and Casper Buffalo Trap added to the archeological section, and the Hog Ranch, a potential national register site, added to our existing historic list.

Comment: The Final Environmental Statement should present the results of all archeological surveys and arrangements that have been made either to preserve or mitigate the impact upon threatened cultural remains through professional archeological salvage excavation.

Response: Part I, page I-639 of the DES, clearly states the conditions of approval for mining plans and rights-of-way to protect cultural values. The analysis indicates a danger of damage to presently unknown archeological sites and provides sufficient control on development satisfactory to both the State Historic Preservation Officer and State Archeologist. "Archeological salvage excavation" is not the only means to an end for developing good records and an understanding of cultural systems, but these matters will be carefully judged by professional archeologists.

Comment: The statement should address itself to the problem of finding more positive alternatives than outright obliteration of any sites that may be found to possess more than passing significance. It would also be desirable for this statement to present a detailed discussion of what procedures will be followed should previously unknown archeological or paleontological resources be encountered during project development.

On page I-285 it is stated that the surveys made of the Carter and Kerr-McGee leases were not intensive and that they have potential for more sites." The Wyodak lease which has no survey (only a statement declaring "no archeological values exist" VI-79) should, along with the Carter and Kerr-McGee leases, have intensive surveys conducted by professional archeologists in order to locate and assess presently unrecorded archeological resources. No provision has been made for surveys along pipeline right-of-way or transmission line

corridors where archeological remains could logically be found. Provision should also be made for the protection of cultural resources uncovered during construction.

Response: The requirements of E.O. 11593 will be met in that decisions will be made to sample, salvage or obliterate by a qualified professional state archeologist under a system developed for implementation by supervisory federal agencies responsible for historic preservation on all sites discovered during development.

A possible means for protecting resources encountered during project development is through the services of a resident basin archeologist. The procedures for administering this type of program have yet to be developed by the responsible agencies.

Comment: In a number of places (e.g., pages II-135 and IV-134) the State Historic Preservation Officer and the State Archeologist are confused. Also (pp. V-77, V-132, VI-104) the State Historic Preservation Officer is referred to as the "State Historian".

Response: Reference in the FES has been made in all cases to the Wyoming State Historic Preservation Officer.

Comment: Since the right-of-way for the proposed railroad has not yet been intensively surveyed (p. II-66), it is unclear how the judgement of impact to archeological resources shown on the chart on page II-166 could have been made.

Response: Under the rating scale on II-166, the proposed route rated lower in adverse impacts than the alternate route that occupied the outer edge of the basin. This was based upon available information for the shallow alluvial edge of the basin. A comparative analysis was made of each route

location from which judgements were made as to relative importance. The proposed and western most routes were adjudged less important culturally.

19. Bureau of Reclamation, Upper Missouri Region

Comment: Page I-266-267. We note the figures given for pipeline cost are apparently based on our Montana-Wyoming aquaduct study. More recent studies for the Northern Great Plains Resource Program based on higher pumping costs, higher interest rates, and a shorter amortization period indicate that the dollar cost per acre foot may be nearly double those shown in the draft.

Response: The text has been revised to reflect these costs.

Comment: Page II-33. A more definite commitment on the removal and saving of topsoil is desirable than simply stating that this will be done "where it is practical."

Response: This section of the railroad site analysis is a description of the proposed action and is based mainly on the contemplated construction and operation practices as presented by the railroad companies. Reference should be made to the Mitigating Measures, Chapter IV, page II-131, as to what will be required of the railroads.

Comment: We believe adhering to the policy of not analyzing off-site out of state impacts caused directly by the operation of the mines may be misleading.

Response: Actual impacts outside the area of consumption cannot be reasonably foreseen due to numerous variables and therefore cannot be discussed. Page I-460 has been revised to reflect this, including a broad general reference to these types of impacts.

Comment: There appears to be an inconsistency between a statement here and one made on page II-29 to the effect that fences will be constructed. On page 1-8, the statement is made that in all probability the railroad right-of-way will be fenced.

Response: The statement on page II-108 has been revised to read "In all probability the right-of-way will be sheep-tight fenced."

Comment: (III-5) It would be helpful to indicate that the Kerr-McGee mine is discussed in Volume 4 of the draft impact statement. The reference to this mine and the Peabody mine on this page, confirms the difficulty of attempting to distinguish the impacts of the specific mine covered by the draft statement and of other operations being conducted simultaneously in the same area.

Response: The FES (page III-5) has been modified to clarify the point.

Comment: (III-21) Will the air and water quality monitoring stations be conducted by the company or under contract by some other entity? What use will be made of the data? There is no indication that any changes in operation will be made in the event adverse consequences of the mining are determined.

Response: The text has been modified to show that A.R.Co. will be constructing most of the monitoring stations and making most of the readings. In addition, the Wyoming Water Resources Institute of the University of Wyoming is working with the company to establish the water monitoring program. The mining and reclamation plan will be modified as necessary if additional mitigation measures are needed.

Comment: (VI-11) What is the estimated acreage of the lake likely to be formed in the spoil area?

Response: The text has been modified to show the estimated size of the proposed lake.

Comment: (Page VI-39) The statement is made that about 60% of the leased area drains into Donkey Creek, a tributary of the Belle Fourche River. If a lake is constructed in the mined area as proposed, flows into the Belle Fourche would be reduced. What will be the impact on the river as a result of reduction of flow in Donkey Creek? Data on the present flows in Donkey Creek would be useful.

Response: The natural runoff of Donkey Creek at the Wyodak lease is estimated to be about 2,200 acre-feet per year. The flow of the stream is presently increased by sewage effluent from Gillette, although Wyodak Resource Development Corp. has contracted with the City of Gillette to obtain this effluent for use by the power plant.

As explained on page VI-98, the plan to reclaim the area as a lake does not appear to be either environmentally or practically feasible. The annual evaporation, estimated to be at least 36 inches per year, would cause the quantity and quality of water in the lake to be unsuitable as fish habitat during much of the year. Although the mining plan may mention the lake as a possible reclamation alternative, no plans have been made to indicate the source of water to fill the lake. As mentioned on page VI-39, the natural water from Donkey Creek is fully allocated and appropriated and not available for other uses.

Comment: We wonder about the need to use herbicide for maintenance of powerlines, rights-of-way in a grassland-sagebrush shrub area (page VI-77). We doubt if they would be needed.

Response: This potential adverse impact to vegetation has been deleted from page VI-77.

Comment: (Page VI-89) The discussion here on the possible pollution of

underground water with toxic mine wastes is inconsistent with the statement on page VI-71 to the effect that aquifers would not be affected.

Response: Page VI-71 treats impacts on aquifers other than water quality impacts. Possible pollution of aquifers from mining operations is discussed under "Water Quality" on page VI-74.

Comment: (Page VI-98) The statement that water in the pit could exceed 6,000 miligrams per liter in total dissolved solids, indicates that the water would not be suitable for most forms of fresh-water fish. Therefore, retention of the mine as a fishing pond might not be practical.

Response: This is correct, and it was discussed on page VI-98.

Comment: (Page VI-105) The statement that native vegetation will be used where "practical and seed is available" is weak and could be easily construed to not require use of native vegetation wherever it were inconvenient.

Response: The statement has been revised to read: Native grasses and shrubs will be seeded to hasten the return to natural unbroken patterns in the vegetation.

20. John R. Swanson

No response required.

21. Oklahoma Gas and Electric Company

No response required.

22. Office of Coal Research

Comment: Additional consideration should be given to the ongoing development of clean coal conversion technology by the Office of Coal Research.

Response: In discussions with various companies and to the best of our knowledge, other than gasification, there will not be any visible development of clean coal conversion technology in the time frame of the statement, i.e., 1990. The companies who were requested to supply development data listed only gasification plants within the time frame being studied. If a technological break through occurs, then the coal development picture will change and require further analysis.

Comment: The possibility of coal slurry pipelines and transmission of coal generated electricity deserves greater acknowledgment.

Response: The distribution alternative (page I-695) discusses the use of these measures in place of the proposed railroad. In the regional analysis, the proposed development was based on information supplied by companies considering development in the area.

23. Cheyenne High Plains Audubon Society

The comments expressed in this letter have been previously answered in the section on hearing comments.

24. Burgess and Davis, Attorneys for Landowners Organization

Comment: The Draft Environmental Impact Statement contains in the Summary Sheet, Vol. I, i, a summary of environmental impacts. The listing of the impacts is eloquent, not by reason of the subjects included, but for those omitted items. It does not mention the impact of Powder River Basin development plans upon the ranchers in the Basin. Nor does it mention the impact of the construction of the largest railroad line to be built in American in the twentieth century. It discusses the impact and

computes the results as of 1980 as if after that date there will be no further impact. In fact, the impacts upon the area will be cumulative and progressive and far more degrading to the environment by 1990 than it will be in 1980.

Response: The summary is not intended to be all inclusive but merely to list some of the major impacts. These impacts were listed by 1990 not by 1980. Items F, K, and L relate to the agricultural sector. The list includes impacts to be caused by the railroad.

Comment: The portion devoted to Agriculture, Vol. I, pages 369-380, and at several subsequent and disjointed places, is a mere statistical summary of the agricultural resources by the graziers of the affected area. The effect of the potential "impact" on agriculture is dismissed by a statistical summary of the "loss" of acres ...4800 acres by 1980...7900 acres by 1985...9500 acres by 1990...and a cumulative loss of 5067 AUM's by 1990. Farming acreage loss is projected to be .7 of one percent of the total available agricultural land by 1990. But those items of "impact" relate only to the mined acres, not the lands taken or ranches severed by the railroad and assumes the only "impacted" lands will be those at mine and industrial sites.

Response: It is assumed that the reference to a .7 of one percent is actually the 0.6 percent projected loss of agricultural land by 1990, found in Vol. II, Chapter V, page I-542. Projected cumulative loss of agricultural lands and preceding cited statistics do not relate only to the mined areas and industrial sites. Refer to the assumption and analysis guidelines found in Volume I, Chapter II, page I-56. The projected impacts to agriculture, including the acreage lost to agricultural production, are based on these guidelines and include the amount of land within the railroad right-of-way. A detailed explanation of anticipated developments that would result in loss of agricultural lands is found in Volume II, Chapter V, page I-542--Probable Cumulative Regional Impacts - Agriculture.

"Construction and development of the facilities described in the introductory part of this impact section will result in land use changes on approximately 29,000 acres. Of this amount, 33 percent (9,500 acres) will have been permanently removed from production by construction of plant facilities, residential areas, roads, and railroads. The remaining 19,500 acres will be in some sequence of reclamation. An estimated 61 percent (11,800 acres) of the temporarily disturbed area will have been reclaimed by 1990.

"Approximately 0.6 percent of agricultural land will be disturbed and lost to production by 1990. The permanent loss will amount to only 0.2 percent of the total available agricultural land. The permanent loss is not a significant regional loss, but it may be quite significant to the rancher experiencing the loss. However, In most cases he is compensated through purchase of his land by the mining company.

Land severance is also discussed in the Regional Analysis as well as the Site Analysis of the proposed BN/CNW railroad contained in Volume III. Severance of lands by the railroad does not necessarily mean that they are lost to agricultural production.

Comment: By polluting the air with mineral and ash discharges and dust, grass production may be reduced and sizeable areas of land may become unsuitable for forage production. Even though the vegetation is not destroyed, vegetation may still be rendered unfit for animal consumption. Activities, such as dust and noise, will discourage grazing in the proximity of such industrial activity and render much land unavailable for grazing. No reference to safe levels for livestock grazing is contained in the Draft.

Response: These items discussed were identified as impacts but no data were available for determining safe levels.

Comment: If atmospheric discharges result in natural accumulations of minerals on the ground, will the surface water then be fit for livestock consumption? Or, must large areas of graze be abandoned?

Response: There are no studies or data available supporting this contention. Particulate matter accumulations are not expected to be sufficient to cause serious problems to livestock water. Established power plants within the basin have not caused any known problems to livestock water quality in the plant vicinity, and livestock grazing has continued since plant establishment.

Comment: Water is also derived from below the surface by means of springs and wells. Springs appear at low elevations where the terrain dips to the water table, or where a break in the strata permits water under pressure in the strata to rise to the surface. Wells are obtained by drilling to water producing strata. If the level of water is dropped significantly by opening of coal pits, there will be no springs and no wells which can economically produce livestock water. What are the results of the monitoring wells drilled by the companies in the Basin?

Why are the results from such wells not included in the Draft? The purported Statement ignores completely the impact on the water resource requirements of ranching operations existent within the Basin. A ranch dependent solely upon collections of surface water is not economically feasible, and a ranch deprived of its wells and springs will have to cease its operations.

Response: As stated in the report, springs and seeps, and shallow water wells that do not extend very far below the water table, will be affected by lowered water levels due to mine dewatering. Some springs and seeps will become dry. The area affected will be local and will be within an estimated 2 to 6 miles of the mine pits. Water will be available to wells from rock formations (Fort Union Formation) at somewhat deeper depths. Water in the Fort Union at most

locations is of better quality than water in the Wasatch Formation which overlies the coal and which must be dewatered for mining operations. Observation wells are planned near the mines to monitor water level changes.

Comment: Will strip mining drop the water table below the level to maintain existing springs? Will wells need to be deepened to supply livestock water? Who will bear the cost of such reworking of wells and additional lifting costs? Will water be available for domestic use? Under the existing law, the rancher will probably have this financial burden. No mention is made of any of these "impacts" on agriculture.

Response: As mentioned in the report, springs in the vicinity of mine dewatering can be expected to become dry. It is possible that a few water wells that do not extend far below the water table will need to be deepened.

Comment: As livestock are not wild animals free to migrate, it is imperative that the terrain in which they are pastured have administrative facilities, such as access roads and lanes, corrals, and buildings, and fences. Artificial barriers, such as fences, must be located so as not to trap livestock drifting with the wind in storms. Experience has shown that heavy livestock losses are caused in the spring when sheep and cattle drifting in front of a blizzard are trapped in corner fences or by obstacles. Such obstacles will proliferate with development in the Basin and by their location will effectively destroy the utilization of some acreage in winter and spring pastures or else result in large livestock losses. No mention is made of this in the Statement nor is consideration given to the problem of main line railroad, spur locations, width of rights-of-way, number of separate grade crossings for school buses, fencing specifications or impact of division of pastures by fences and cutting off livestock water from pastures and drying them up. Nor is consideration given to

lessening the impact upon the ranching community by bringing the new line of the old Chicago Northwestern line at Douglas rather than East of Douglas.

Response: It is agreed that livestock losses could occur during blizzard conditions due to obstacles such as those created by new roads, railroad, etc. This will be brought forward in the Regional and Railroad Site Analysis portions of the Impact Statement. It must be pointed out that there is a profusion of fences, deep-cut draws, highways, roads and other obstacles present within the area that already cause livestock losses during these storms and that additional obstacles may not cause significant increased losses. This addition is made to the appropriate sections of the document.

The "problems of mainline railroad spur locations, width of rights-of-way," . . . etc., were considered. These all relate to land severance and access problems and are discussed in the Volume I, Chapter V, and Volume III, Chapter III.

It is assumed that the following comment: "Nor is consideration given to lessening the impact upon the ranching community by bringing the new line of the old Chicago Northwestern line at Douglas rather than East of Douglas." refers to the alternate route that would originate at Douglas. Consideration was given to this alternative and reference is made to Volume III, Part II, Chapter VI, specifically to p. II-166. The route analyzed is referred to as the Douglas corridor. It was considered that the overall impacts to agriculture would not vary significantly between the proposed route and Douglas corridor since many of the impacts would only be transposed from one location to another. Some additional loss of cropland would occur along the proposed route that would not occur along the Douglas corridor.

Comment: No mention is made of how livestock may cross such a corridor. An underpass that long will be a black hole full of rattlesnakes in the summer, tumbleweeds in the fall, snowdrifts in the winter, and mud in the spring.

Response: It is agreed that cattle underpass structures discussed in the Description of the Proposed Action may cause some problems for livestock crossing of the railroad right-of-way. No information is readily available pertaining to the effectiveness of these underpasses although various conflicting opinions exist. The problem of cattle under pass structures relates to anticipated severance problems which are discussed within the regional statement and railroad site analysis. The location, number, and type of cattle underpass structures are subject to negotiation between the railroad companies and the local ranchers. Effectiveness of these structures would be highly dependent on location, which information is currently unavailable.

Comment: To date, the Burlington Northern and Chicago Northwestern railroads have not advised the landowners of the location for the proposed railroad line. They have not discussed compensation nor crossings nor fences nor severance damages. Such items as location and compensation all reflect upon the impact upon the landowners. Not only are those items ignored in the Draft, but they are ignored and not discussed by the railroad companies.

Response: It is agreed that the location of the railroad route will have impact upon the landowners. The general location of the proposed route and alternative routes are found on Map No. 12 of the Appendix. In addition, a major portion of the proposed route has been surveyed and staked on the ground.

Compensation to the landowners for the railroad right-of-way is subject to negotiations. Evidently most negotiations have not been completed but this information is not available for analysis of impacts.

25. Bureau of Mines

Comment: Page I-22, last sentence: Either add a sentence or modify the last sentence to indicate that underground mining research will develop new mining techniques that will yield a much higher percentage of recoverable coal than is possible with present methods. Bureau of Mines and industry research is aimed at this goal and we are confident that recovery will increase.

Response: Although the thick coalbeds of the Eastern Powder River Basin are presently amenable to mining by underground methods, such methods would likely not be permitted because of resulting coal waste. However, underground methods would be appropriate to many thin beds beneath thick overburden. The text has been revised to indicate that underground mining methods directed to full recovery of thick coalbeds are a subject of serious concern and research by principals of the mining industry.

Comment: Pages I-30 and 32, last sentence: The statement "between two and three percent" should read "between 3 and 4 percent."

Response: The text has been revised.

Comment: Pages I-31 and I-57: The graph shown on page I-31 does not agree with the table for projected coal production on page I-57. The production figures in the left-hand column of the table appear to be incorrect by a factor of 10.

Response: The table is correct. The vertical axis of the graph is in error and should have read: thousand of short tons. This correction has been made.

Comment: Page I-94, next to the last sentence: One problem that may arise with in situ gasification is subsidence. Although the statement indicates that in situ mining should be considered for specific circumstances only, we believe

that the possibility of subsidence is a problem serious enough to warrant mention.

Response: It is agreed that subsidence may occur, especially when coal-beds are located near the surface. The text has been revised to consider this comment.

Comment: Page I-163 and others: The terms scoria and clinker appear on this page and are used many times throughout the report to describe rock that was altered by the burning of underlying coal. A more correct term would be baked shale or porcellanite. At the urging of members of the Geological Survey, the term baked shale was used to describe such material in the Northern Great Plains Study. We suggest the final environmental impact statement indicate an awareness of the terminology problem and use either baked shale or porcellanite rather than scoria or clinker.

Response: These terms are used and known locally. Additions to the glossary have been made to clarify the meaning and interchangeable use.

Comment: Page I-189: Pipelines are not discussed, although several cross both Campbell and Converse Counties. The pipelines are shown on Map 4, Energy Resources of the Eastern Powder River Coal Basin, in Volume V Appendices, but they are not discussed elsewhere except to say that the proposed railroad between Gillette and Douglas will cross pipelines in the Hilight oilfield area. It further states that those pipelines will be protected. We believe that the text should briefly describe pipelines in the area, the effect of coal and rail development on them, and plans for their relocation or protection if necessary.

Response: Pipelines are discussed generally under the transportation network sections of the DES. Generally, there will be no appreciable impact on pipelines and flowlines beyond a few hours interruption of service and either temporary or permanent relocation in already disturbed areas. This situation

exists because lessees of federal coal must recognize prior rights before mining can proceed. Where federal mineral resources are involved, both the supervisor of mining operations and the supervisor of oil and gas operations of the U.S. Geological Survey are available in either supervisory or advisory roles to assure orderly and timely continuance of service by pipeline.

Comment: Page I-679, second paragraph: We believe that the figures of 65 percent recovery from underground mines is a little high. In a sampling of 200 underground mines, it was found that the percentage of recovery rarely exceeded 60 percent and, depending on the type of mining used, was usually between 50 and 60 percent. We suggest that the 65 percent figure be modified to between 55 and 60 percent.

Response: The text has been revised.

Comment: Page I-682, second paragraph: We believe that acid mine water, if produced at all, will be localized within a given mine or mines and is unlikely to be a serious problem.

Response: The text has been revised to indicate that acid-mine water will likely not be of concern except in rare and local instances.

Comment: Pages I-708 and I-743, Production from the Outer Continental Shelf: We believe that this section is much too long and detailed. In an environmental statement detailing the environmental impact of mining coal in the Powder River Basin, it is questionable, for example, that there is any parallel or direct relationship to oil wells and their effects on the shrimp catch in the Gulf of Mexico. Oil exploration and production will occur on the outer continental shelf with or without development of Powder River Basin coal, and environmental effects in the Gulf or other offshore areas should not be injected to confuse an environmental statement on coal mining in Wyoming.

Response: It is true that exploration and development of continental

shelf resources will proceed with or without development of Wyoming coal. However, both are public resources and the degree of development of each, i.e., the relative emphasis, is a policy decision based in part on environmental considerations. Therefore, a comparison of the two is required by logic, by law (National Environmental Policy Act of 1969), and by regulation (Council on Environmental Quality Guidelines, 40 CFR Part 1500).

Comment: Page I-800, first full paragraph: The estimate of 47 billion tons of surface mineable coal in the Rocky Mountain and Northern Great Plains provinces is far too conservative. Figures developed by the Northern Great Plains Work Group indicate that approximately 81 billion tons of coal is recoverable by surface mining methods in North Dakota, Montana, and Wyoming alone. Other Rocky Mountain states contain approximately 3.5 billion additional tons of coal recoverable by surface mining.

Response: The text has been revised.

Comment: Page I-871, Lost Production: We believe that the information given on this page is misleading. It implies that the 16,600 acres of land, estimated to be permanently lost to livestock production, will result in the loss in production of a large number of animals. However, when calculated through, the 16,600 acres would support only about 250 AUMs per year. Considering the alternatives of not mining the area to save it for livestock production, such numbers are minute. We suggest the page be revised to (1) define an AUM; (2) explain how many AUMs would be lost per year; and (3) indicate how many animals would be denied to the Nation by 1990. This procedure would bring the information into perspective and help show the relative value of mining versus livestock production in the area. Further, it is stated that the land used for roads, plant sites, and railroads will be permanently lost. However, we see

no need to retain plants and roads once mining has been completed. Even power plants have only a 35-year life expectancy. If the 16,600 acre figure is in fact correct, then it should be explained more fully.

Response: Reference is made to Part I, Regional Analysis, Chapter IV, Description of Regional Impacts and Chapter V, Probable Cumulative Regional Impacts - Agriculture. It appears that the information as presented would be misleading since an estimated total of 9,500 acres is projected to be permanently committed to other land uses. This would represent an annual loss of 1,723 AUMs of livestock forage.

The last paragraph has been revised to read: "The addition of an anticipated 2,400 acres of residential and commercial development would result by 1990 in an estimated total of 9,500 acres being irreversibly and irretrievably committed to uses other than presently exist on the land. This change will mean a permanent loss of wildlife habitat and grazing land. Displacement of all animals species from this land will occur."

Conversion of livestock forage into animals denied to the nation is difficult as different forage requirements are necessary to carry either yearling cattle, cows with calves, or sheep, etc. Other variables are also present that cannot be readily determined. Expressing livestock production in terms of forage has the advantage of being easily derived from existing information and forage production is relatively consistent and measurable on an annual basis.

It is not agreed that land use changes for roads, plant sites, and railroad would not represent a permanent land change. These type of developments are either self perpetuating or are replaced by a land use of equal or greater value.

Most facilities are not removed unless some economic value can be realized. The cost of returning such sites to livestock grazing would usually exceed value derived from grazing.

Comment: The only reference to reclamation of quarry sites and sand and gravel pits for road metal, fill, etc., appears on page II-132. We suggest that similar requirements for reclaiming quarries and pits be included for the mine sites (Volumes III and IV).

Response: Mitigating measures for the four mine sites require reclamation of disturbed areas including quarries, pits, etc. These are shown on pages III-125, IV-128, V-123, and VI-96 of the FES.

Comment: Overall, we believe the descriptions of mining methods and rehabilitation covered in Volumes III and IV are adequate. However, we were unable to find a discussion of the possibility of using or marketing fly ash. The environmental statement notes that both bottom ash and fly ash will be buried in the mine. However, fly ash has several alternative uses. It is possible that some ash produced from power plants in the area could be used for making cement, concrete, or concrete products, as construction fill and road base, and for soil stabilization. Other uses might be for the manufacture of bricks, as lightweight aggregate, and as a mineral filler in asphalt. Still other uses for fly ash have been demonstrated in oil well grouting, for foundry core sand, as a filler in plastics and chemicals, for blasting grit, and highway sanding. We suggest that a short section on the possible utilization of fly ash be added to the section on the Wyodak mine, Volume IV, pages IV-1 thru IV-171.

Response: The text on Wyodak has been revised to show this potential. (See Mitigating Measures section.)

26. Wilderness Society, Western Regional Office

Comment: Air pollution resulting from the project is of equal concern, because not only does the local region tend to lose in its air quality, but areas miles away, such as Bighorn Canyon National Recreation Area and Devils Tower National Monument (areas of public use and interest), will feel the effects of stripmining. While the air quality declines in these recreation and scenic areas, the people-use increases, contributing to an already worsening situation.

Response: These types of impacts were not discussed specifically. (See hearing comments and responses.) However, they were discussed in general terms on p. I-466 and 467.

27. Wyoming Farm Bureau Federation

Some of the Comments raised in this letter have been previously answered, basically under the hearing comments section.

Comment: Volume I, page I-42 paragraph 4. In the paragraph discussing the "outlook for the agricultural industry . . . is one of continuing deemphasis," explain more fully what you mean by "continuing deemphasis."

Response: Agree that the statement is not one of clear meaning. The text has been revised to read: "decline in percent of the total economy of the impacted area".

Comment: Volume I, page I-48 paragraph 1. How many miles of prime all-weather paved roads will be built; will they be state or county maintained; and how many miles of improved gravel roads will be built? These roads may also benefit agriculturists.

Response: The 24 miles represent a best guess of the miles of prime all-weather access roads to be built by 1990. The estimate does not include haul

roads and other company roads which may be built. Little information was obtainable from the Wyoming State Highway Department as to needs or projected plans.

Comment: Volume I, page I-48 paragraph 4 and page I-50, lines 1-8.

"Deep aquifers containing salty water not suitable for irrigation, or animal or human consumption are the proposed water sources." This implies that the State Statutes giving authority for the coal slurry line would have to use or contemplate using poor quality water.

Response: This statement is not intended to imply that poor quality water would have to be used. The use of poor quality water from deep aquifers was stated as the proposed water source by the company involved and was reiterated within the document.

Comment: (Volume I, page I-52 paragraph 1) In the paragraph discussing water quantity it is stated that "Sources of water to meet these needs could be provided from available and unused ground and surface water or by transfer from present uses (irrigation, etc.)." Are you advocating the use of water right transfers and the use of unused shallow underground water?

Response: The Draft Environmental Statement does not advocate, or recommend, the transfer of water rights, or the development of underground water. Estimates were made (page I-53 and I-486) of water required to develop coal resources in the study area, and potential water sources were tabulated (page I-489). The development of water sources will be the responsibilities of coal development industries and municipalities that need the water.

Comment: Volume I, page I-59, item 6. The proposed guidelines for reclamation scheduling to restore to livestock grazing use indicates a minimum of two years to revegetate the spoil and mined areas. Erosion of these areas as well

as controlling weeds could become a very serious problem. Appropriate seeding and other control measures should be undertaken.

Response: Erosion and weeds can become a problem; however it will require a certain length of time to prepare the mined area for revegetation.

Comment: Volume I, Chapter II, page I-79, paragraph 2, sentences 5, 6, 7, and 8. Based on the assumption that the best technology will be applied, an estimated 70 to 80 percent of the mined land surface would be expected to be successfully rehabilitated under existing climatic and soil conditions. Why only 70-80% of the mined lands may be successfully rehabilitated? Is this figure conducive to the area in question? Identify the basis for using this percentage.

Response: The text has been revised to delete this statement.

Comment; (Volume I, page I-79 paragraphs 1 and 2) Statements declaring that rehabilitation techniques to include the reestablishment of vegetation have not been successful to reach a near climax are misleading and incorrect. To date, there are over eleven test plots and reclaimed areas within Wyoming which have shown successful results in techniques of reclamation. When properly applied, reclaimed lands can produce a near climax vegetative condition and also surpass present climax conditions in vegetative types.

These paragraphs should be supplemented with statements reporting the results and efforts already attempted to reclaim strip mined lands.

Response: Statements in the document, declaring that rehabilitation techniques cannot produce climax or near climax vegetation, are adjudged correct. Succession is the natural progressive development of vegetation towards its highest ecological expression (climax) or final state. Since the processes involved are infinitely complex, and require considerable length of time, they

cannot be duplicated by man. Rehabilitation techniques cannot replace climax or near climax conditions, only time and a natural ecological process can do this.

Comment: Campbell County dropped in cattle and calf numbers to 60,600 in 1962. Stock sheep numbers have been declining. However, in 1964 Campbell County showed 176,000 head for a high and low of 80,000 head in 1950, while Converse County showed a high of 135,000 head in 1958, and a low of 104,000 head in 1950. We request that these calculations be considered in determining if sheep numbers are declining.

Response: The statistics offered do not contain sufficient information for analysis. However, they reveal that sheep and cattle numbers for Campbell County and Converse County 1964 (303,700) are considerably higher than sheep and lamb numbers for 1972 contained in Table 36 page I-370. Evidently 1964 was a peak period of sheep production; however, a steady decline from this period to at least 1972 has occurred. An error was noted in the text, which may have lead to this apparent discrepancy. Page I-371, second sentence was revised to read numbers recorded were 303,700 head of sheep in 1964 (instead of 1974).

Comment: In Volume I, Chapter IV, page I-236, the paragraph on coyotes is not accurate since coyotes take a toll on a great many sheep and on wildlife when domestic livestock are not available. A draft environmental statement of February 8, 1972, U.S. Bureau of Sport Fisheries and Wildlife, indicated 80 percent of predators taken by toxicants and 20 percent by trapping, denning and shooting.

Data prepared by BSF&W refutes, rather than supports, that coyote populations act to "check" rodent populations. The BSF&W will not support the

contention that coyote populations fluctuate with rabbit and rodent populations.

In Volume II, Chapter V, page I-527, the statement "Such disturbances can lead in time to increases in coyote predation on livestock and some species favored by man" is a mis-statement. Coyotes are already preying on livestock and wildlife.

We note that the black-footed ferret can be adversely affected by losses of prairie dog colonies. Does this ferret presently exist in the area?

Previously it was stated that coyote (and other predator) populations fluctuate with prey species. Now a reduction in prey results in a coyote buildup. Which hypothesis can be substantiated?

Response: The entire topic of predator (animal damage) control is highly controversial. Biologists and ecologists throughout the country are wrestling with (and often disagreeing on) the task of determining and accurately describing the extent, significance and ecological relationships of predator-prey issue. The intent of brief remarks in the DES regarding predatory wildlife species was certainly not to provide a treatise on predator control, but simply to point out a relationship which exists in the study area.

The reader should note that on page I-326, coyote predation is one of many agents acting to check rabbit and rodent populations.

Through habitat disturbance and destruction small mammals will experience losses. Mobile species such as coyotes will be displaced. This will create temporary predator "buildups" in adjacent areas where natural buffer species may be inadequate to satisfy the needs of higher numbers of predators. Temporary "switches" in major prey species will occur. Resultant increases in predation on livestock and some species of wildlife not normally sought after seems a reasonable conclusion.

References in the DES regarding the possible presence of black-footed ferrets and other habitat requirements in the study area have been numerous.

Reports of ferret sightings in and near the study area provide the basis for considering their presence to be highly likely.

Comment: (Volume II, page I-498, line 1) Why does it appear "that Green River water will be the only water imported?"

State why Platte River, Yellowstone River, Yellowtail Reservoir, or Big Horn River water won't be used, instead of Green River water. This comment has been mentioned several times and mention of other water importation projects is not made. The Bureau of Reclamation has done an aqueduct study for the study area and the Green River was an alternative as were the other rivers.

Response: The draft EIS states that due to existing compact agreements and available supplies, if importation of water is necessary, it is most likely to be from the Green River. The possibilities of imported water from the various basins are discussed on pages I-266 and I-267 in Volume I.

Comment: "Collision hazards . . . are certain to increase." Do you have facts or figures to back up the inference that "quite a number of collisions are going to be realized?"

Response: Wildlife biologists have long been concerned with losses of wildlife through relatively hard to control means such as "road kills" on highways and railroads. Given proper conditions significant segments of wildlife populations (i.e., deer, antelope) may be lost. The prediction that collisions will increase in the Eastern Powder River Basin as a professional judgment seems entirely reasonable.

Comment: In Volume II, page I-528, the statement "much of this water maintains a fish and wildlife habitat base on irrigated meadows. . ." is a little fanciful. There is fishing in the Powder River Basin, but fishing in the ditches and dry streams is far fetched. To imply that fishing abounds all over the irrigated area is a bit untrue.

We would also like to know whether the figure 1 million or 1.5 million acre-feet is the correct amount filed with the State Engineer for change in use.

Response: Any implication that "fishing abounds everywhere" is unintended by authors of the DES, and we agree such a statement would be untrue. Remarks, from which the above comment was taken out of context, are intended to relate to all species of terrestrial and aquatic wildlife which depend on irrigated agricultural land and water complexes for all or part of their life cycles. This paragraph related primarily to water source outside the study area being examined by industry as potential water supplies. Potentially affected waters and agricultural land areas are the Green River Valley, the Torrington area, the Buffalo area and the Boysen-Bighorn Basin area.

Comment: In the fourth sentence 1.5 million acre-feet figure used as the amount of water that has been requested to be changed from agricultural to industrial uses. Is this the correct figure? Whether the 1.5 million acre-feet is wrong or the 1 million acre-feet is wrong on page 501, paragraph 4, Volume II, these two figures should agree.

Response: We have learned that the surface water filings in the State Engineer's Office used in our statement represent some multiple filings, consequently the erroneous figure. These may constitute filings in excess of available water, either actual or through prior rights. All reference to the 1 and 1.5 million acre-feet have been deleted from the FES.

Comment: Volume II, page I-539, paragraph 3. It is stated that the sand, gravel and clinker material may be mined from stream courses and this will impact scenic recreation lands. Are these stream beds and limestone outcrops really as scenic as the DES would have people believe? "Scenic" is nebulous unless quantified. What scale is being used?

It does not seem quite accurate that sightseeing in some of these remote areas is as important as implied. Much of this country is private and therefore, little sightseeing occurs, and since many of these streams are intermittent, it does not seem as though the recreation impact would be very great.

Please refer to Volume II, page I-537, paragraph 2. A recreation use of 10.86 acres per visitor day is not heavy use compared to Yellowstone and other areas.

Response: A scenic scale would have to be described through the values of the beholder. Despite this variation of values, scenery is frequently related to natural patterns exhibiting relief and color.

If natural lines and formations are broken by irregular patterns, often related to vegetative or earth moving projects, then the scene becomes unnatural.

The reference to 10.87 acres per visitor day not being heavy use as compared to Yellowstone and other areas cannot be located in the environmental statement under the cited reference or in other volumes. Page I-539 does not attempt to evaluate this impact but rather states it will have some impact on the present landscape.

Comment: Volume II, page I-542, paragraph 3) It is stated that "0.6 percent of agricultural land will be disturbed and lost to production by 1990," but it fails to state what is produced on this land and then it is stated that: "the permanent loss is not a significant regional loss. . ." On what basis are these facts stated? Tell what the production is on these lands and what is grown there. The second statement appears to be a biased judgment and would appear to be opinion rather than fact.

Response: The regional impact statement does not contain site specific analysis because this type of information was not available for the entire

study area. Therefore the information had to be developed by other means because:

1. Actual facts and figures are rarely available when projections of the future are being made, therefore it is necessary to develop assumptions based on available information.

2. The exact area to be converted to another land use by 1990 is not known; however, the area anticipated to be lost to agriculture can be projected based on known acreage requirements for similar developments.

3. The specific agricultural land use, whether it is grazing land or cropland, was unknown, and information is not readily available; however, statistics concerning the type of agriculture lands within the two counties is available.

4. The actual productivity, type of cropland, and grazing land are unknown, nor is this information in available form for analysis except as statistical information which was used to develop assumptions and projections.

Since the reference cited in the comment is an analysis being carried forward from previous sections within the document, reference is also made to the previous section for information used as the basis to derive these projections (Volume I, pages I-369 through I-380).

The assumed production of these lands is contained within Volume I, pages I-369 through I-380 and the projected losses to agricultural productivity are contained in Volume II, pages I-542 through I-548.

"Approximately 0.6 percent of agricultural land will be disturbed and lost to production by 1990. The permanent loss will amount to only 0.2 percent of the total available agricultural land. The permanent loss is not a significant

regional loss, but it may be quite significant to the rancher experiencing the loss. However, in most cases he is compensated through purchase of his land by the mining company."

Agriculture is therefore projected to remain the dominate land use within the region on 99.8% of its former area; this cannot be construed as a significant impact.

Comment: Volume II, page I-545, paragraph 2. DES discusses loss of livestock watering facilities and the high cost of replacement wells, etc. Isn't it probable that the coal companies will have made arrangements with the various ranchers to help alleviate this situation prior to beginning operations? Hopefully, the coal companies will want to get along with the rancher and it should be part of the agreement if it isn't already, that if facilities dry up, then the companies will replace them.

Response: Chapter V of the reference cited is entitled, "Probable Cumulative Regional Impacts." Without some type of mitigating measures being taken the impacts projected in paragraph 2 could occur. It is very probable that the measures included in the comment are among those available to mitigate the impacts; requirements and stipulation may require that stockwater facilities be replaced as a condition of the mining plan approval. A paragraph has been added on page I-459 of the FES to clarify the intent of Chapter V.

Comment: Volume II, page I-546, paragraph 1. DES begins by estimating that a quantity of nonirrigated cropland (hay and wheat) will be removed from production. Isn't it possible that the mining companies in their reclamation of

these lands will add some wheat and hay land? It would also be interesting to find out what is actually produced on these lands now.

Response: The reference commented on is stated as an impact if no mitigation is achieved. Refer to pages I-619 through I-635 of Chapter VI, Volume II for the presentation of mitigating measures for resource disturbance.

It is possible that reclamation of mined lands may permit crop production. However, the probability that reclaimed lands will have the productive capacity of unmined land is not considered to be good, and this was not considered a viable alternative land use following rehabilitation.

Comment: Volume II, page I-547, paragraph 1. In the fourth sentence it states that "Irrigation water is the major supply available to industry. . ." Major implies that it is in the greatest abundance; however, isn't it possible that deep underground water and surplus surface waters are in even greater abundance? Industry should be encouraged to explore for deep underground water and to use surplus surface waters before agricultural purchases are contemplated.

Response: "Greatest abundance" is not synonymous with "major supply available to industry." Each company is responsible for developing its own water supply and will search and develop the most economical and dependable supply within the legal constraints of water rights. Industrial companies have purchased at least 12,000 acres of irrigated lands within the Powder River Basin, having an estimated 13,200 acre-feet per year of water rights assigned with the intent of having the water rights changed from irrigation to industrial use. This practice is expected to continue. More information concerning availability of water is contained in Volume I, pages I-195 through I-267 and Volume II, pages I-485 through I-503. "Surplus Surface Water" needs clarification as no known "surplus" of surface waters presently exists. The abundance

of deep underground water has not been determined as to its potential, and poor quality may restrict its uses. In addition, the potential for long-term use of groundwater is equal to the annual recharge from surface water.

Comment: (Volume II, page I-653, paragraph 5). The statement is true as long as irrigation water is the only water used. "Adverse, unavoidable impact" are pretty strong terms and the whole process could be partly avoided if surplus surface waters and deep underground waters were used. Urge and encourage companies to build reservoirs to store surplus surface waters and drill deep underground wells to lessen the impact on agriculture.

Response: Development of water supplies for coal utilization, other than for the mining of coal, will require construction of reservoir storage of presently unused and unappropriated surface water, and/or the development of groundwater sources which are virtually untapped at present except for stock and domestic purposes, for a few municipal water supplies, and for waterflood in secondary recovery in oil fields. The development of either surface-water supplies or groundwater supplies will require time and considerable sums of money.

Comment: (Volume II, page I-698 - 691, Alternative Reclamation Objectives) "Rehabilitation of lands solely for grazing purposes would impact and limit other land uses" is an extreme statement. . . why plant sagebrush? why design water impoundments?. . . specifically for wildlife habitat?"; the multiple use concept should prevail.

Response: Comments made concerning this section indicate that the purpose of the alternative section was misunderstood. Each of the analyzed reclamation objectives in this section was mutually exclusive. Each objective is an alternative way of proceeding. A variety of potential land uses can be considered

after surface disturbance has occurred. Methods of reclamation should be chosen with a specific land use objective in mind following mining (page I-693).

Comment: The statement "By 1990, an estimated total of 9,500 acres will have been irreversibly and irretrievably committed to uses other than presently exist on the land," needs explanation, as do the other two sentences.

Response: The reader should refer to the Assumption and Analysis Guidelines found on pages I-56 through I-60 in the DES.

28. Texas Utilities Services, Incorporated.

No response required.

29. University of Wyoming, Geochemistry Component Black Thunder Project

The major comments raised by this letter have already been answered under the hearing comment portion.

Comment: The impact statement (e.g., page III-108) does not really make the point that pumping water from the pit into Little Thunder Creek will raise the salinity of the creek and will probably make the water downstream from the mine unsuitable for livestock and wildlife use. We think this question should be discussed in more detail in the impact statement. Also, since A.R.Co. has many analyses of ground waters from the coal and overburden (the waters which will probably be pumped from the pit), we think the impact statement should include a tabulation of these analyses.

Response: A permit from the Wyoming Department of Environmental Quality, Water Quality Division, is required for release of water into stream drainages. Quality control standards for discharges into stream drainages are controlled by the Federal Water Pollution Control Act, as amended in 1972, and by the

Wyoming Environmental Quality Act of 1973. This is discussed in more detail on page I-617 of Volume II.

Little Thunder Creek is not a perennial stream but flows only in response to rainfall and snow melt on an intermittent basis. Water pumped from the pit can be expected to be of similar quality to water pumped by wells for livestock use in the area.

30. Atlantic Richfield Company

Responses to some of the comments raised by this letter (i.e., 50% reduction, socio-economic mitigation) have been answered under the hearing comments.

Comment: Next, the adverse impacts of several of the alternatives to the proposed action were not adequately evaluated in this draft. Specifically, we refer to the alternative which would prevent or seriously restrict the development of the coal deposit. The nation needs this coal, and there are certain environmental benefits to be gained through its use.

Response: Without knowing specific location of projects outside of the area under primary study, it is difficult to analyze and discuss specific impacts.

The type of impacts indicated in the comment were recognized and mentioned. Refer to No New Development alternative, paragraph 5 under impacts - "Much of the eastern coal is of higher sulfur content; air pollution could become worse" - Restrict Development alternative (Delay . . . New Technology), paragraph 2 under impacts - "This could result in blackouts, brownouts, reduction in economic development, and inability to supply consumer demands." Without analyzing each separate generating facility, it is not possible to quantify these impacts or determine their magnitude.

Comment: Revised Mining and Reclamation Plan

Our fourth concern is that Part III, "Analyses of proposed Mining and Reclamation by Atlantic Richfield Company" does not properly incorporate the mining and reclamation actions we proposed to take at Black Thunder. The reason for this is obvious.

Our "Revised Mining and Reclamation Plan for the Proposed Black Thunder Coal Mine", dated May 20, 1974, was not submitted to you and other governmental personnel until June 10. The mine plan described in the Draft E.I.S. is generally correct, but our reclamation proposals, particularly as they pertain to reclaimed land forms and rehabilitation techniques, have been completely updated, so that the statements made in the draft E.I.S. on these subjects are obsolete. Also, many of the actions we propose in order to mitigate possible adverse impacts are not discussed. Anyone reading our revised plan should become aware of our environmental concerns as they relate to surface mining in the Powder River Basin.

Response: The text in the FES has been modified to incorporate applicable portions of the "Revised Mining and Reclamation Plan for the proposed Black Thunder Coal Mine" dated May 20, 1974.

Comment: Lastly, we believe it would be desirable if, throughout the statement, the impacts of surface mining were separated from the impacts of other coal-related developments, such as power plants. This would enable the public to put the different types of proposed operations into proper perspective.

Response: The purpose of the analysis was to assess the cumulative impact of total coal development, including all associated facilities. It is not feasible to separate impacts by type of causative agent since mining of coal goes hand in hand with construction of various facilities.

Comment: Use of Roland, Roland-Smith, Wyodak, Wyodak (Roland) to identify the Roland coal seam.

Response: The term Wyodak, with modifiers such as upper, middle and lower is the preferred name for the coalbed(s) in the area of the proposed and active surface mines. The previously used names, Roland and Smith, were retained in the impact statement to acknowledge their use by mining companies at the local sites, but were not intended to indicate correlation to the type areas of the Roland and Smith beds. This has been clarified in the text.

Comment: (I-1 Summary 3-1) There will be considerable change in wildlife habitats because the final revegetated surfaces will be changed, but they will still support life. Some populations of wildlife will be reduced but some will increase. Substitute: "Wildlife habitats will be altered and populations will respond to the new situation -- some species increasing and some decreasing."

Response: Final statement summary has been revised.

Comment: (page I-17, paragraph 1, line 7) There is no Pacific Power and Light lease block at this location.

Response: The text in the FES has been revised to reflect that the PP&L lease lies to the west.

Comment: (page I-51, paragraph 2, line 3) It is Atlantic Richfield Company's understanding this 230 KV transmission line will be in service prior to 1978. This will be necessary if we are to maintain the production levels proposed.

Response: The statement made in the DES is correct, the line will be in operation by 1980, one of the three time periods used in the statement for analysis purposes. This does not mean it will not be in service until 1980.

Comment: A statement should be included in the "assumptions and analyses guidelines" to the effect that it is assumed any impacts lasting over 30 years are permanent.

Response: This addition has been made in the final EIS.

Comment: Not all coal will be stored in silos. Other types of facilities will be used (DES I-86).

Response: The text at this point is describing the general type of facilities which will be utilized. Based on the mining plans presently available for review, the majority of the coal will be stored in silos for loading in unit trains.

Comment: The section on coal gasification deals with only the Lurgi process since it is "the only method currently being considered for large-scale use". Other potential processing techniques should at least be mentioned.

Response: Other potential processing techniques for coal gasification are located on Table I, page I-98; coal liquification is discussed on page I-103.

Comment: I-121, paragraph 5 - Wind roses from the Moorcroft Weather Station indicate that prevailing winds are not westerly.

Response: Prevailing winds within the Powder River Basin are westerly. However, local topographic conditions influence direction and velocity. This is pointed out in Volume I, page I-124.

Comment: I-285, paragraph 1, second sentence. This should read: "George Zeimens, Assistant State Archeologist, has identified six sites on the Black Thunder lease area, two of which are being considered for salvage." (See Wyoming Environmental Institute Report, July 1974 - Enclosure I).

Response: The text in the final EIS has been revised.

Comment: The treatment of Shore Birds and Song Birds, page I-337, could be more meaningful if dealt with by habitats. Insect studies have to deal at a smaller taxonomic unit than family to be meaningful. Some species warrant specific studies due to their abundance and impact.

Response: We acknowledge that various approaches to treatment of the above topics and others throughout the DES were open to us. Available information and specificity of same varies rather widely. The intent of the DES is to offer the reader a solid estimate of "what is present and what will happen if proposed coal development comes to pass."

Comment: Prevailing wind is not northwesterly (pages I-463 and I-446).

Response: While the prevailing direction of surface winds at Moorcroft is southeasterly, the more critical wind direction is considered to be winds aloft into which stack emissions are released. Although little data are available for the study area on the direction of winds aloft, the prevailing direction for the area is estimated to be northwesterly.

Comment: References on page I-468, paragraph 1, should be made to appropriate comparative data so that the reader can make an intelligible evaluation.

Response: The paragraph in question has been revised to remove the cited data.

Comment: (I-471, 472) Section on topography should be expanded to include other types of surface mining (see Revised Mining and Reclamation Plan for the Black Thunder Coal Mine -- May 20, 1974).

Response: The text in the FES has been revised.

Comment: I-504, paragraph 2, line 3. How does this correlate to the 20% to 30% mentioned in Volume I? What is the basis for this figure?

Response: We are unable to find the location of the 20 percent to

30 percent in the text. The 54 percent is the amount of land out of 4,800 acres that will be occupied by plant and mine facilities and gasification plants. Some areas will not be disturbed but cannot be used because of the location of facilities and protective fencing.

Comment: On page I-518, paragraph 1, line 10, we suggest change in wording to: . . . " in a change in species composition and numbers that would be considered undesirable by many."

Response: Text has been revised.

Comment: (I-521, paragraph 1) The figures presented mislead the reader as to the impact. (Page I-650 says that 14,000 acres is only 0.3% of the study area.)

Response: The acreages on page I-521 and I-650 are located in different sections of the DES and in different subject areas (i.e., I-521, wildlife and I-650, topography). No relationship between the two exists, and the meaning of the comment is unclear.

Comment: (I-522, Table 11, Group I) What is a Wright's flycatcher? (Emphidonax wrightii = Gray flycatcher)

Response: Table 11 has been amended to read "flycatchers, spp."

Comment: A snipe is a sandpiper. "Avocet" is misspelled. Refer to Group VIII, I-522.

Response: The spelling has been corrected. Information sources reviewed during draft preparation indicate the common or Wilson's snipe and various sandpipers fall in the same family (i.e., Scolopacidae) but are otherwise distinct. Refer to Table 31, Appendix C, Volume V, C-61, 62.

Comment: Volume II, page I-523 - The Atlantic Richfield Company plans to reestablish the shrub component through the transfer of shrub pads.

Resonse: While some shrub reestablishment may be feasible, depending upon species and site conditions, it seems unlikely that large expanses of the sagebrush community could be reestablished in this manner. In the arid west, big sagebrush plants usually develop deep tap roots to reach available moisture during dry periods. This allows the sagebrush to survive drought where other species could not. Tap roots often go 10 to 15 feet down. The survival rate of plants such as these, transplanted with roots severed near the surface, would be expected to be very low.

Comment: Volume II, page I-523 - We believe that there is a good possibility reestablished plant communities will improve rather than deteriorate in terms of productivity and species diversity. Poor land use practices would result in a deterioration in existing as well as reestablished vegetative cover.

Response: Refer to the general comment section. Species diversity can be expected to increase as natural successional forces cause encroachment of various native shrubs, forbs, and grasses back into the seeded-grass communities. This will be a long, slow process however, and is not expected to have occurred much by 1990.

Comment: Page I-533, paragraph 2 - The mourning dove responds readily to changes in land use. A preliminary analysis of U.S. Fish and Wildlife Service Breeding Bird surveys for the Powder River Basin is enclosed. While a detailed analysis of these data is anticipated, this preliminary analysis is included for the benefit of the writing team (Enclosure VI).

Response: Additions to the text have been made.

Comment: (I-570 Housing) It might be useful to the reader to know that vacancy rates were not considered in this discussion because of the low level of vacancy rates in Campbell County. More recent information on housing can be found in the Preliminary Environmental Impact Assessment on the Black Thunder Coal Mine (Enclosure IV).

Response: Vacancy rates were not covered in impacts as they were covered in Chapter IV, Housing, (specifically Tables 49 and 50). Repeating them in the impact section would be unnecessary repetition.

Comment: On page I-612, one or more lines appear to be missing at the bottom of the page.

Response: A line was omitted in the DES which has been inserted in the FES.

Comment: (I-644, paragraph 3, line 7) The loss of labor from the agricultural industry is not necessarily a result of coal development. Agriculture is losing labor worldwide.

Response: In context of the entire paragraph, it was stated that some labor would be moving from the sectors in which it is presently employed into coal related employment. The paragraph pointed out that the loss of labor from agriculture would likely be long term and the loss from petroleum industries and other residentiaries would be short term. There was no inference that the long term loss of labor from agriculture is solely attributable to the coal industry or any other single employment sector.

Comment: (I-665, paragraph I) It is true that sufficient permanent housing may not be immediately available, but this does not necessarily mean that the populations would have to accept inferior quality housing in that there are extensive development plans for first class housing developments and mobile home parks.

Response: It appears that in a county where 42.3 percent of the 1970

housing is in the form of mobile homes, many residents are already forced to accept inferior housing. In all likelihood this will continue, particularly under the influence of a population boom. At the present time, there is no guarantee that enough first class housing units will be available to accommodate the demand for an estimated 5,500 additional units by 1980.

Comment: (I-666, line 1) This assumes the highly unlikely event that no additional teachers will be hired between now and 1990.

Response: These figures represent an increase in the need for teachers by 1990. The text has been revised to clarify this point.

Comment: (I-666, line 2) This assumes that no physicians, dentists, professional nurses or other social workers can or will be recruited to the area. This is not the case since Campbell County is already actively attracting and recruiting new physicians. Quality of health care may actually improve.

Response: Since Campbell County is presently deficient in the number of physicians, dentists, registered nurses, licensed practical nurses and pharmacists, the logical conclusion was that there will not be enough of these professional people to meet the increased demand for their services by 1990.

Comment: (I-667, paragraph 1, line 2) This assumes no additional personnel will be recruited on the police force. This is not a reasonable assumption.

Response: The first sentence in the paragraph points out that the deficit is based on personnel presently available. The purpose of the analysis is to illustrate the demand for their services.

Comment: (I-667, paragraph 4, line 1) Correct, if the word "current" is placed at the beginning of the sentence. This assumes no expansion of the existing water and sewer facilities.

Response: The text has been revised in the FES.

Comment: Administrative management of areas to be mined is an alternative that is being considered in detail in the Federal Coal Leasing Environmental Impact Statement. Should it be considered here as well?

Response: Yes, the coal programmatic EIS on leasing has not been issued in final form so that it could be referred to in this document. At any rate, a discussion of all alternatives is required in each EIS.

Comment: I-691, paragraph 3, 1st sentence: Reclaimed spoil would most likely be unstable as a base for foundations. Therefore, without preplanning these areas could not be used for urban and commercial development.

Response: We concur that if this alternative were selected, an analysis of the base material would be needed. The engineering problems could then be worked out.

Comment: Oil shale development is not discussed as an alternate energy source.

Response: The alternative was inadvertently omitted from the DES. A discussion on oil shale has been added to the FES starting on page I-929A.

Comment: (I-850, paragraph 2, last sentence) Miners will become a part of a long-term stable population and although new population will no doubt bring in a new set of values, they will not be those normally associated with transient labor population.

Response: The text has been corrected to omit the reference to transient.

Comment: I-862, line 4: There is no reason to believe the better soils will be buried in reclamation practices.

Response: Better soil layers will probably be buried if you consider the thin layer of surface material below the topsoil in relation to the total depth of overburden to be removed and replaced in a new area. Refer to Volume II, I-627, paragraph 3, first two sentences.

Comment: There are fewer than 50 elk in the vicinity of the Atlantic Richfield and Kerr-McGee leases. See III-84, paragraph 2. These elk generally stay to the east of the lease sites. Correlate with I-863, paragraph 3, line 6.

Response: Revision and clarification is necessary on I-863, paragraph 3, line 6 and the FES has been revised. Available information indicates a "top" number of 90 elk to be residing in the Rochelle Hills complex.

Comment: We have seen no evidence to suggest the possibility of subsidence due to groundwater production from the various aquifers on the eastern Powder River Basin. This paragraph should be justified.

Response: There is no evidence in the Powder River Basin that suggests subsidence due to groundwater withdrawal. In some parts of the U.S., however, subsidence and lowering of land surfaces has occurred over a period of time when large parts of the aquifers were dewatered. In these areas, water was released from clay beds with subsequent compaction of the clay. In the Powder River Basin, most of the finer-grained deposits in the near-surface rocks consist of shales rather than clays. The shales will also release water if dewatering takes place, and some compaction of the shales is a possibility although the shales would probably compact much less than clay beds. Some local subsidence is a possibility if water well fields are developed and considerable (several hundred feet) dewatering and draining of shale beds occur.

Comment: (I-873, paragraph 2) Mining activities described in Parts III, IV, V, and VI differ appreciably from current strip mining operations in the east. It does not seem reasonable to predict numbers of disabling injuries and deaths based on current accident rates in eastern strip mining and pre MESA controls.

Response: The text has been modified to indicate that differences in

mining methods, and attention to safety precautions can cause differences in the number of disabling injuries and deaths in the future.

Comment: Because of the extensive nature of our corrections and modifications in Section III, we have xeroxed this section showing suggested modifications marked in blue.

Response: A review of the material was made; where we concurred, the text was changed.

Comment: (III-17, paragraph 3) Additional information on the location of electrical lines (Enclosure V) is attached which will allow you to rewrite this section.

Response: The section has been revised to the extent possible in the FES.

Comment: (III-27, paragraph 2, line 3) Under a wetter climatological regime such depressions would fill with water and breach the lowest point. Erosion at that point would then drain the depression. Comparison of the Roland Coal Isopach Map with the Roland Coal Overburden Isopach Map (RMRP*, 20 May 1974 Enclosures I and II) shows that subsidence over burned coal is not involved.

Response: The FES text has been revised accordingly.

Comment: (III-27, paragraph 2, lines 5, 9, 10) The Rochelle Hills are composed of shaley clays with isolated sandstone lens and are capped by coal clinker (resulting from burned Roland Coal) and natural brick ("scoria" resulting from baked overburden clays). The escarpment is not a massive resistant sandstone exposure. The cracked and broken cap of natural brick and clinker form the resistant layer that protects the shaley clays from erosion and also provides a soil of greater porosity allowing Ponderosa Pines to grow on the hills.

Response: The FES text has been revised accordingly.

Comment: Figures for the drainage area of North Prong of Little Thunder Creek and Little Thunder Creek are wrong. Figures for the mean annual flow for North Prong Little Thunder Creek are probably high.

Response: Corrections made in FES.

Comment: Closed basin formation not due to burning of underlying coalbeds (See comment III-27, paragraph 2, line 3).

Response: Pages III-27 and III-65 have been revised to indicate that differential settling of the underlying deposits may have caused the small ponds and depressions characteristic of the Atlantic Richfield lease and adjacent area.

Comment: The term "community" is used in Table 11 and Figure 9. Ecosystem is used from pages 71 to 75. Community is probably preferred. In any case, adding animal and soil classifications to the vegetative community designation does not make this a discussion of ecosystems.

Response: The term "ecosystem" is being retained in the text because it is used in reference to plant, animal, soils, etc. The term "community" in the text is used to define a specific unit in the ecosystem.

Comment: Archeology. Updated information in Wyoming Environmental Institute report July 1974 (Enclosure I).

Response: The text in the FES has been revised to reflect the new data.

Comment: (III-79-81) A discussion of the color, intrusiveness, absorption, and accents of the visual impact of a surface coal mine should appear here in the report.

Response: The pages quoted occur in the section which describes existing conditions on the lease area. The section on page III-115, (Probable Impact of Proposed Action) describes the impact of a surface coal mine on the existing environment.

Comment: (Secondary access roads, National Grassland roads) The description of access to Little Thunder County Road from Highway 59 is incorrect. Wright Road and its connection via Road #928 are absent (see Thunder Basin National Grasslands map - 1973). Suggested insert: Wright County Road . . . deadends at County Road T-7. Two miles north on T-7, Little Thunder County Road extends southeast and east approximately 26 miles to Lynch County Road. Wright Road will possibly be extended eastward 4½ miles between the Atlantic Richfield and Kerr-McGee leases as the major access road for both.

Response: The Wright on the map refers to the old post office site and is not a road name. Road #928 does connect to the Hilight Road on the west end. In general, the roads in this area have several names, and, until this is standardized, the road names as used in the text are the ones commonly used.

Comment: (III-103) This three-paragraph discussion of probable impact on soils contains some incorrect information based on the obsolete mining plan. The use of inclusive adjectives and generalized statements detracts from its ability to discuss probable impacts objectively. A discussion of destruction of the existing soil pattern and alteration of soil character appears in the Wyoming Environmental Institute report of July 1974 (Enclosure I).

Response: Changes have been made to correspond to the new mining plan. Sentence 2, first paragraph is covered in the mitigating measures section.

Comment: (III-111, paragraph 1, lines 6 to 7) Routes for the railroad spur and access road have been selected (Enclosure V), allowing identification of vegetative communities affected.

(III-111, Paragraph 2, lines 6 to 7) The plant site has been selected allowing acreages of disturbed vegetative types to be calculated. (Revised Mining and Reclamation Plan, May 20, 1974, page 26).

Response: The FES has been revised to reflect the changes.

Comment: (III-138) Obsolete. The proposed reclamation plan on pages 31 to 64 of the Revised Mining and Reclamation Plan, May 20, 1974, addresses mitigation measures. Habitat loss, including replacement of Reno Reservoir are discussed therein.

Response: We concur with the objectives discussed in the reclamation plan, but further information may be needed as stated in the mitigating measures section to completely evaluate or reduce the items listed in the impacts.

Comment: (Appendix A, Map 6) For the Atlantic Richfield Company mine, the number of permanent employees shown on the map should be 225, and the number of construction workers should be 100.

Response: Map in FES has been revised. Information on map was obtained from information submitted previously by A.R.Co.

Comment: Relating to Appendix C-38, due to a change in subject matter, a new subtitle Permanent Habitat Losses, should be inserted above the third paragraph.

Response: The text has been revised.

Comment: (Appendix C-39, line 7) The actions described will not preclude the reestablishment of wildlife, but rather the mix of wildlife will be altered considerably -- favoring man-adapted species.

Response: We agree to a point. For all practical purposes though, permanent construction of parking lots, buildings, etc., as described in I-521, will preclude reestablishment of most desired types of habitat. Refer to Appendix C-37, paragraph 1, lines 1 through 10.

Comment: (Appendix C-39, paragraph 1, line 6) Acreage figures given for lost habitats do not agree with page I-518, paragraph 2, line 1. Acreage figured seems high and should be explained.

Response: Acreages reflected on C-39 are approximate values. The Assumptions and Analysis Guidelines section (pages I-56 through I-60) should be reviewed for explanation of gross acreages used in the DES.

Comment: (C-40, paragraph 1) First sentence should read: Permanent changes from terrestrial to aquatic categories may also occur.

Response: Text revised as suggested.

Comment: (Volume V, page C-40) "Either man-induced or natural processes" should read: Natural processes, often times accelerated by man's reclamation activities. . . .

Response: The text has been changed to read: Natural processes, often-times influenced by man's reclamation activities

Comment: (Volume V, page C-41) Although the studies referred to show that vegetative cover is less on farmland abandoned 40 to 50 years ago, than on adjacent undisturbed rangeland subject to the same grazing pressure, it also shows that range conditions are actually better on the abandoned fields than on the adjacent rangelands. See Enclosure I, page IX-44.

Response: The studies referred to indicate that after about 40 years "a range community with nearly the same or slightly higher range condition ranking has resulted as compared to native man-disturbed areas." This rating of range condition follows the SCS techniques which, in general, rate a site by how close it comes to supporting the climax vegetation which should eventually develop on a given type of site in a particular precipitation zone. Thus, terms such as "fair," "good," "excellent," etc., describe a range of percentages of the climax vegetation present. These condition ratings cannot be used to describe the value of the range as habitat for wildlife either in general or in particular. For example, "fair condition" range may be excellent antelope winter range and "excellent condition" range may be pure grassland and poor sage grouse habitat.

Comment: (Volume 5, page C-42) Enclosure I, referred to in C-41 gives a more positive view of vegetation recovery along pipelines. We believe this should be considered. Unattended pipeline and abandoned fields are not comparable to a situation of well-managed rehabilitation such as that contemplated by the Atlantic Richfield Company.

Response: The raw data and the interpretations of the investigators from the studies referred to have been thoroughly considered. It is not clear what is meant by a "more positive view of vegetation recovery". Two statements in the study are perhaps the most pertinent: "The areas of disturbance along the two pipelines on the lease area seem quite capable of vegetation" and "by observing the pipeline areas, it is quite evident that the capability for fast and good revegetation is directly related to the severity of disturbance." It should be remembered that the purpose of the discussion in this portion of the DES text is to analyze the impacts of proposed actions on the wildlife portion of the existing environment. The data discussed pertaining to the pipeline revegetation are not meant to be either positive or negative; they are merely a statement of documented conditions which are pertinent to the value of revegetated areas as habitat for existing native species as compared to the existing habitat values on undisturbed range. It is also pertinent to acquiring some understanding of the time period involved in recovering wildlife habitat values to something nearly equal to what presently exists. The pipeline data supports the statement made in the last sentence on page C-41 (Volume V).

It is agreed that conditions on pipelines and abandoned fields are somewhat less than comparable to rehabilitation as contemplated by Atlantic Richfield. While there is almost certain to be a much more intensive effort to rehabilitate disturbed lands by Atlantic Richfield, it is also certain that mined land disturbance will be much more severe and extensive than that found on pipelines and abandoned farms.

Comment: (Volume V, page C-42) It is not correct to assume that rehabilitated mined lands will receive little or no continued special management. Mining companies will be long-term residents of the area and will have ample opportunity to take additional corrective measures if initial rehabilitation efforts are not successful.

Response: Some rewording is in order in the FES. The intent of the statement was to point out that over most of the lands involved, once a stand of vegetation (probably seeded grassland) has been established, it will eventually have to "go it on its own" without the benefit of such practices as temporary irrigation, fertilization, total protection from grazing, etc. All of these have been discussed by various individuals and companies as possible ways to achieve revegetation.

Comment: (Volume V, page C-43) To say that sagebrush grassland "may be unable to recover" is a generalization. Recovery should be defined, in terms of range conditions ground cover, biomass, etc.

Response: The text has been reworded to the following: "Once these sagebrush grasslands have been severely disturbed, they may be unable to recover to a point to which they will provide habitat of similar type, quality, quantity, and for the array of species that presently exists on the undisturbed rangeland."

Comment: (Volume V, page C-43) While vegetative cover may well be reduced, it must not be assumed, as was done in the Draft Environmental Impact Statement (page I-59 Item 7) that productivity for grazing purposes will also be reduced. On page IV-48, Enclosure I, observations by the University of Wyoming research team are "It is very possible that in general, more herbage is being produced within abandoned fields than on the undisturbed native areas."

Response: The assumptions made in the DES (page I-59) were made on the basis of a wide variety of information (refer to the General Comment Section).

While the studies and research evidence documenting significantly reduced vegetative cover on disturbed lands were considered, they were only one of many factors upon which a reduction of productivity for grazing was predicted. The speculation of possible greater herbage production on abandoned farmlands than on undisturbed native areas is without substantiation. It is also felt by individuals knowledgeable of other abandoned farmlands in the area that total vegetative production is greatly depleted; this is also unsubstantiated.

Comment: (C-45, line 2) The cottonwoods, and the Black Willows (Salix exuga) that they are associated with, can be replaced by planting and nurturing shoots in appropriate location.

Response: The text has been revised to read: "Almost no recovery of habitat values associated with cottonwood trees above the sapling stage is expected during the study period."

Comment: (C-45, paragraph 2, line 12) "Total numbers of biomass" is a meaningless phrase. Perhaps the author meant "Total numbers and biomass."

Response: Text has been revised.

Comment: (C-51, paragraph 3, line 3) What is meant by "total wildlife?" If the author is referring to diveristy, the statement is true. If he is referring to biomass, the statement is debatable.

Response: Some change in wording is appropriate. The text has been revised to read: "Most changes will be toward less total wildlife production and will involve trade offs between species and types of wildlife or between wildlife in one area for wildlife in another."

Comment: (C-52, paragraph 2) Due to the nature of the overburden in the

study area, highwall cliffs would soon deteriorate, and would probably not provide increased nesting sites for various birds.

Response: Change or deterioration and erosion of highwall cliffs no doubt will occur. Nevertheless habitat requirements of such species as listed on C-52 are often satisfied in relatively unstable areas (i.e., bank and cliff swallows).

Comment: (C-63, Family: Turdidae) All species listed below Eastern blue-bird belong in family: Fringillidae.

(C-64, first family) Audubon's warbler no longer exists as a species. It is included with yellow-rumped warbler.

Response: The text has been revised.

31. Carter Oil Company

Comment: The first paragraph on page IV-104 should be rewritten to correct inaccurate figures and statements on effect of mine dewatering, especially as to how far water levels will be lowered in response to mine dewatering.

Response: Additional data from the Carter Oil mining plans have been analyzed, and drawdown effects of mine dewatering have been modified. The first paragraph on page IV-103 in Volume IV has been revised in the FES.

Comment: The graphs on page I-494 which show drawdown for given distances and times should be deleted from the EIS because the graphs do not apply to drawdown of water levels at the Carter Oil lease. Industry will not obtain water supplies from formations which are only suitable for stock water wells.

Response: The graphs were not intended to apply to dewatering of coal and overburden during mining operations. As stated on page I-493, the graphs were constructed for application to large-scale development of water supplies from the thick (several thousand feet) sandstone and shale formations that underlie the surface of much of the Powder River Basin.

Water supplies from these thick sandstone and shale formations have been developed for other than stock purposes. The water supply for the City of Gillette is obtained from these formations. The wells at Gillette range in depth from about 200 feet to more than 3,400 feet. A number of water supplies for waterflood in oil fields in the Powder River Basin obtain water from these formations. In the Hilight field in southeast Campbell County, as much as 3,000 feet of casing has been perforated and open to the well.

Comment: The question of slope angles ought to be reexamined. In defense of steep slopes we draw to your attention that Carter's mine area already contains appreciable areas with slopes steeper than three to one.

Response: Reference is made to Volume II, Chapter IV, pages I-623 through I-629, which contain a discussion of topography, steepness of slope and shaping spoils. It is universally recognized that steepness of slope is critical to land surface stability and essential to the success of mined land rehabilitation. The loose unconsolidated spoil material resulting from mining must be graded to a slope that offers optimum conditions for land stability, drainage control and revegetation. The National Academy of Science report on rehabilitation potential of western coal lands considered the degree of slope to be extremely important and the following is quoted for consideration. "Placement of excavated overburden should be such as to offer optimum conditions for stability, drainage control and revegetation. Overburden removal techniques need to take account of the fact that maximum vegetative stability cannot be attained on slopes steeper than 33 percent (3:1). Optimum vegetative stability requires slopes of less than 25 percent (4:1) (Environmental Protection Agency 1972), and use of agriculture machinery may require that slopes be no greater than 20 percent (5:1). Various alternate land uses such as wildlife habitat, building sites, or farming

may tolerate a range of slopes pointing up once more the need for careful establishment of land use objectives."

Natural slopes of greater than 3:1 do occur within the Powder River Basin and vegetation does occur on them. Generally the erosion hazards are critical and are the product of the natural or geologic erosion process reflecting the historical and physiographic conditions inherent within the area. Significant protective vegetative cover has never developed due to the steepness of slope and to erosion activity which prevents significant accumulation of topsoils. Generally these steep areas are considered to be problem watershed areas and are the major contributors of silt and dissolved solid contaminants to surface water. May, et al, 1971, in consideration of reclamation of strip mine spoil banks in Wyoming considered that "spoil banks without extremely steep slopes would probably present the best opportunity for successful revegetation." It was also found in this study that for an economically sound revegetation program, spoil banks should be accessible by machinery for seeding and mulching, and slopes did not revegetate until stabilized from erosion.

Slopes steeper than 3:1 neither permit the use of machinery nor is stability necessarily achieved at this grade without surface manipulation. Redistribution of topsoil is also impossible on slopes steeper than 3:1. The permissible slope angle is already well established, or data can be obtained, from the abundant existing disturbed slopes in Campbell County.

Comment: We are concerned that the proposals requiring coordination and certification of archeological surveys by the State Archeologists may set precedent for (a) Federal stipulation of state procedures for enforcing both federal and state laws and requirements, and (b) stipulation of regulatory procedures outside the boundaries of provisions existing in statutes, codes, and regulations. Certification of the type recommended ought to be given very careful consideration

as to cost versus benefits, and it should be weighed carefully relative to the other elements that might also be certified, to determine if establishing a precedent for multiple certification by the several special agencies is really advisable. If some such certification is deemed necessary, and Carter questions the wisdom of splintering responsibility for monitoring environmental conditions among several agencies, then Carter recommends that the procedure for such certification be incorporated in the general procedures for securing a mine plan to insure that the proposal obtains an adequate hearing and is given due consideration by the responsible agencies, both federal and state.

Response: The purpose of the certification requirement in the mining plan is to insure that a qualified professional archeologist is used in determining the archeological values. Some companies, in good faith, have not used the professional archeologist for their examinations or received clearance from the State Preservation Officer.

The state controls the data bank for archeological information and can best determine the cost-benefit from the data gaps. This opportunity must be insured through clearly defined approval requirements and stipulations in a mining plan or right-of-way.

The plural form of agency is not intended as a multi-agency certification of all ventures but intended to cover a variety of activities monitored by the principal land managing or mining development agency and the Wyoming State Historic Preservation Officer.

Federal statutes (E.O. 11593) clearly require an approving federal agency to insure protection of cultural values on all federal surface lands or where action is taken on subsurface land. The State of Wyoming and its Environmental Quality Act (section 35-502.12(a)(v) require, as a condition of approving the

mining permit, that similar safeguards also be taken on designated restricted areas. Therefore, it is intended here that the principal approving and/or supervising federal agency be assured that the state has given its clearance to the area, that protection of cultural sites on undesignated areas is provided and that the permittee maintains a continuing system of notifying the Wyoming State Preservation Officer when new evidence is encountered during development.

32. Kerr-McGee Coal Corporation

Some comments contained in this letter are similar in nature to previous ones (i.e., slope stability, 50 percent loss in productivity) and have already been answered prior to this point, either under the hearing portions or under previous letters.

Comment: (Page I-22) Although underground mining may be possible in some areas of the Eastern Powder River Basin, the first sentence of the first full paragraph and the subsequent discussion incorrectly imply that the entire coal reserve is amenable to extraction by either open cast or underground mining and that the judgement as to which mining method to use is based entirely on economics. Actually, present technology severely limits the reserves which can be recovered at any cost by underground techniques.

Response: There was no intent to imply that the entire coal reserve is amenable to mining by either opencast or underground methods. Rather, the coal reserves and resources of the basin can be mined by both surface and/or underground methods with due regard for constraining variables. Constraints aside, either method can be used with a penalty of great cost for surface mining of thin coalbeds beneath thick overburden, and a penalty of great sacrifice of coal recovery for underground mining of relatively thick coalbeds.

Sometime in the future the thin coalbeds beneath thick overburden will probably be mined by underground methods. The text has been changed to indicate that at this time surface mining is the preferred method.

Comment: From the general discussion of archeological and paleontological values, it would appear that considerable evidence has already been gathered relevant to a fairly homogeneous Powder River Basin area and that, as with past development of populated areas, coal development will assist -- rather than deter -- the recovery of further evidence. The sentence on page I-285, which states, "The Kerr-McGee and Carter reports were not intensive archeological surveys and more sites which were not seen or recognized probably exist in these areas." is an unsubstantiated and subjective conclusion which implies inadequate investigation by the Kerr-McGee archeologist.

Response: The discussion on I-285 differentiates between the extensive survey conducted by the Kerr-McGee archeologist where a surface reconnaissance provided evidence to support the conclusion that more sites may exist and an intensive survey where more systematic surface examinations and possible digs may be necessary.

Comment: (Pages I-292 to I-312) There are numerous references to historical sites outside of the Campbell County, Converse County areas that have no bearing on this environmental impact statement and should therefore not be included in it. For example, figure 47 and text refer to preserved Oregon trail ruts that are outside of the Powder River Basin coal development region and not endangered by development in the Powder River Basin.

Response: The regional analysis of cultural resources is particularly pertinent to development of the Powder River Basin as federal and state land managing agencies must issue permits for support facilities across the basin and off the North Platte River (paralleling the Oregon Trail). Sand and gravel

will be sought along the waterways where other historical and archeological values will naturally be located.

Population growth from development will seek the historical sites for recreation and provide a threat to their preservation and enjoyment.

Comment: (Page I-460) New land forms may emerge from coal removal in relatively limited areas at the time in which these operations are being carried out. However, the general nature of the existing natural land forms in the Eastern Powder River Basin is similar in many respects to those created by surface coal mining even if no reclamation action is taken. Furthermore, reclamation laws will require proper reclamation techniques to be employed so that there will not be improper placement or insufficient reclamation of spoil materials. In view of these facts, the implications on this page that surface mining will significantly impact on the topography of the area is not warranted.

A single mining operation producing 17.5 million tons of coal per year in a 60-foot coal seam will disturb approximately 180 acres per year in uncovering the coal; however, if the mining operation uses a shovel-truck or similar method of overburden removal, grading can be done concurrently with mining and seeding will take place as soon as the growing season permits. Therefore, no more than 360 acres will be unreclaimed and unvegetated at any one time.

Response: Concur regarding reclamation law, techniques and supervision; however this section portrays the impacts which could occur without considering mitigating measures. Some modifications have been made, however; using a factor of 1,770 tons/ft/acre, 165 acres are mined each year. Thick overburden will require pre-stripping more than 100 acres.

Comment: One (1) 197-foot silo does not contain 50,000 cubic yards of concrete, but rather approximately 2,000 cubic yards. Thus, Table No. 7 is in

error and the cumulative sand and gravel requirements by the year 1990 would be 97,000 cubic yards, based on the EIS estimate of the number of silos as 97. 3.6 million cubic yards of aggregate required for roads, rairoads and silo construction is in error (also see page I-539 and I-867).

Response: An error in computation was made. However, based on information obtained from Amax, their 193.6-foot silo contains 4,000 cubic yards of concrete. The estimate on page I-481, 482, 483, 539 and 867 has been revised utilizing the 4,000 cubic yard estimate and a typical design standard of mix ratio.

Comment: (p. I-499) Water infiltration rates in reclaimed overburden are expected to be higher than through natural ground due to erosion-prevention techniques on the surface and uncompacted fill material.

Response: It is not known whether infiltration will be greater or less through backfill deposits. It is generally agreed by the people consulted by the EIS team that during the early years after reclamation, the reclaimed fill should be more permeable than the original deposits. As compaction and consolidation take place, the reclaimed overburden is expected to be less permeable because the deposits will be more hetergeneous than before disturbance.

Comment: The omission of socio-economic mitigating measures from both the regional analysis and from the site analysis is glaring At least two significant mitigating influences which would be helpful to discuss at some place in the EIS are the following: (1) Decision makers are receiving advanced warning of the potential socio-economic impacts. (2) Wyoming will receive large amounts of tax and royalty income as a result of coal development.

Response: No mitigating measures for socio-economic impacts were mentioned that could not be legally prescribed under existing federal, state, or local statute. Kerr-McGee appears to support this stand at least as it applies to

archeological values. Their comment for page I-639 is, "If there is no present law which specifically requires the indicated action, the paragraph should be deleted." This concept is endorsed, particularly for socio-economics when a seemingly unlimited number of company plans for community development could be listed along with numerous new powers that federal, state and local governments would like to acquire to allow for planned growth regulations. Such a listing of potentialities could certainly mislead the reader into believing everything was well in hand when there is no requirement that these potentialities be met or ever reach fruition.

In response to "Decision makers are receiving advanced warning...." is a mitigative measure provided the information received is put to a beneficial use to alleviate socio-economic impacts. But to what extent programs are actually implemented and how many impacts they would actually mitigate would be speculative. Part I, Chapter VI, Land Use Planning, Zoning and Control, does emphasize the need for cooperative planning efforts to be conducted at all levels of government with public and interest group participation.

Comment: (Page I-639) We question the basis for the words "Furthermore, it will be required. . ." in the next to last paragraph. If there is no present law which specifically requires the indicated action, the paragraph should be deleted.

Delete the first line and the first three words of the second line of the last paragraph and combine the remainder with the second sentence so that it will read: "A full-time resident basin paleo-archeologist under the supervision of the State Historic Preservation Officer would aid in reducing lead time and development delays by performing advance surveys."

Response: The laws, and responsibilities of the Federal Government to them, are explained in Volume II Part I 637-639. Steps being taken in approving

mining plans with stipulations that insure protection of archeological values encountered during coal development are fulfilling that responsibility in part.

Development in the basin initiated by industry and requiring offsite support facilities must bear the financial responsibility for its potential disturbance of resources. Where irretrievable values are threatened this responsibility becomes more acute.

Comment: (p. I-653) There is no evidence that ground water will be used for mining beyond the recharge capacity of the aquifers in the area. Also, the aquifer capacity in the area exceeds the projected demand. Therefore subsidence due to use of ground water should not be charged as an adverse impact of mining.

Response: It is agreed that water demands for coal-mining operations can probably be met by mine dewatering. However, should large-scale ground-water developments take place from thick sections of Tertiary and Cretaceous age sand and shale formations, some subsidence is a possibility and must be considered as a possible impact. Such subsidence, if it should occur, would be restricted to areas where several hundred feet of these formations have been dewatered. Should pumping later stop, the water level would return to its original level, but the compacted shales would no longer hold as much water as originally.

Comment: Stating that vegetation on 14,000 strip-mined acres will be temporarily destroyed by 1990 does not give proper credit to revegetation that will continuously be done in 15 years of mining.

Reclamation activities are being successfully carried out in Montana and Arizona under climates similar to those in the Wyoming study area. Fifty years for natural plant succession will only be required if the mine spoils

are abandoned (see the National Academy of Sciences report "Rehabilitation Potential of Western Coal Lands" (page 58).

Response: Vegetative destruction on mined land will be temporary if reclamation is completed as scheduled. Vegetative composition or density will not be the same as the original vegetative cover.

Comment: The following absolute statements...produce an imbalance of evidence, an unwarranted sense of gloom. . . : "There will not be enough physicians, dentists, professional nurses and other social workers to meet the demand."

"Collection and treatment facilities for Douglas and Gillette will be overutilized by 1980."

"Treatment facilities will unavoidably be unable to meet projected demand."

Response: This statement is warranted, simply because Campbell County is already deficient in its number of physicians, dentists, registered nurses, licensed professional nurses, and pharmacists. The ability to meet an increase in demand for these and many other services is doubtful. This sentence has been clarified to show reference to current facilities. Given the projected population increase, these current facilities will be overutilized.

Comment: Arbitrarily, and without considering mitigating measures, the draft proposes restricted development as a means "to enable the community to plan and develop needed housing, educational and social services in advance of need rather than after these facilities have already become inundated and overcrowded." It should be pointed out that the overcrowded conditions described in the environmental impact statement, i.e., the inadequacy of existing supply

in comparison with future projected demand -- do not represent totally unavoidable adverse impacts and should not be accepted without qualification as decision factors for consideration of alternatives to the proposed actions.

Response: The unavoidable impacts described in the socio-economic section (Chapter VII) represent unavoidable impacts in the sense that the increase in demand for services and facilities reflects a population increase. The alternative of Restricting development in phase and staged with socio-economic development is merely an alternative for consideration and not a proposal.

Comment: (p. I-689) Highwalls should only have to be fenced if highwall reduction is not used.

Response: Fencing of highwalls is considered only a temporary safety measure and is not a substitute for rehabilitation measures such as highwall reduction.

Comment: (p. I-868) The statement that subsidence will occur if large

quantities of water are pumped from an aquifer should be qualified to indicate that excessive pumping can be avoided if the need arises.

Response: The statement on page I-868 has been rewritten and qualified. Permits to pump water from these aquifers and the authority to stop pumping, should excessive pumping take place, will be administrative decisions by the Wyoming State Engineer.

Comment: (p. V-1) Change 4,192 acres to 4,966 acres. Surface and coal ownership should be revised as follows:

	<u>Surface</u>	<u>Coal</u>
U.S.	640 acres	4,352 acres
Kerr-McGee	320 acres	0 acres
Others (private)	<u>3,392</u> acres	<u>0</u> acres
TOTAL	4,352 acres	4,352 acres

Central Louisiana Electric Company should be added to the list of purchasers of Kerr-McGee coal.

Response: The FES has been revised to reflect this updated information.

Comment: (Page V-4) Change "mine stripping" in the first sentence to "overburden removal."

Page V-5 (Figure 2) notes only one of the federal coal leases. W-24710 should be included.

Page V-8 Change soil material removal to topsoil removal.

Response: The title for Figure 2 was in error since the figure does include both federal leases. As a result the figure title and text have been revised.

Comment: (p. V-9) Rehandling of overburden will vary depending on equipment and overburden characteristics. A 35 percent rehandle factor is not always

correct. Suggest the words "of approximately 35 percent" be deleted from the last line.

Figures 6 and 7, Chapter III, Part I show a dragline which is not included in Kerr-McGee's plans. If a figure is to be included, it would best be placed in Part V and only a truck-shovel system shown. Otherwise the parenthetical remark referring to Figures 6 and 7 should be qualified by adding the words "(Somewhat similar tobut without the dragline.)"

Suggest the following paragraph be inserted just before the last paragraph: "Use of wheel-tractor scrapers for overburden removal would require equipment for service, maintenance and coal removal operations of approximately the same size, type and quantity as used for truck-shovel and dragline operations.

Response: The text has been revised.

Comment: (p. V-11) Delete "Each cut would be opened from the east and moved to the west."

Response: The text has been revised.

Comment: (p. V-12) The discussion of the alternate coal handling system is unclear. Suggest the second and third and fourth sentences of the first full paragraph and the first sentence of the second paragraph be combined by stating: Coal will be loaded onto trucks by either a front-end loader or shovel and hauled to the crushing facility."

No open storage will be used. Therefore, the last sentence of the second full paragraph should state, "Coal will be stored in silos prior to loading into unit trains."

Response: The text has been revised.

Comment: (p. V-13) Delete "one or two fill areas will be fine graded at a time while the fill area closest to active mining will be left unfinished

to avoid interfering with mining." The sentence refers to dragline stripping only.

In the second paragraph, delete: "and will provide the greatest degree of flexibility in creating desired land topography."

Add the following statement after the last paragraph describing final disposition of haul roads: "Buildings and other surface facilities not used for ranching will be removed and the areas reclaimed."

Response: The text has been revised.

Comment: The ditch section, Figure 11, Chapter III, Part I should have variable bottom widths with a single scraper width as optimum. Ditch hydraulics should be design criteria. Therefore, the third paragraph should be changed to read: ". . .will be constructed generally as shown in Figure 11. . ."

Response: The text has been revised.

Comment: (p. V-16) The second sentence should be changed to read: "Railroad grades will be maintained at a maximum grade of one percent."

Apparently, there is a typographic error in the first sentence of the second paragraph as "will be required" is repeated two times.

Also electric power will be required for pit drills, mine dewatering pumps and other electric-powered mining equipment. Therefore, suggest the words "and other electric powered equipment" be added to the first sentence of the second paragraph.

Response: The text has been revised.

Comment: (p. V-17) The heading of the list of equipment should be changed to "Dragline or Shovel-Truck System" since some of the equipment will be used for either system. Also, since the "Use" column explains what the equipment is used for and the asterisks are incorrectly applied, delete the asterisks and the note to which they refer.

"Truck-mounted Pit Drills" should be changed to read "Track-mounted Pit Drills" and Wheel Tractor Scrapers - size 24 cu. yd." should be changed to "Wheel Tractor Scrapers -- size 24-35 cu. yd."

Response: The text has been revised.

Comment: (p. V-18) Delete the title "Dragline System," since this is now merely a continuation of the table on the preceding page.

Outside coal storage will not be used. Therefore, change first sentence under "Storage Facilities" accordingly.

(P. V-19) Reference to Figure 6 should be to Figure 8, Chapter II. The following sentence should be substituted for the second sentence under "Monitoring": "Ten hydrologic monitor wells have been completed on the lease."

Response: The text has been revised.

Comment: (p. V-27) The last sentence of the first paragraph which reads, "Detailed soil inventories must be conducted on the lease area and adjacent lands in order to properly evaluate impacts on the land and the relationships to the existing environment." should be deleted because it is an unwarranted conclusion. The ultimate impact on the land will be determined by Kerr-McGee's operations, and operational decisions will necessarily be based on more detailed soil investigations as operations proceed.

Response: It is not an unwarranted conclusion because of the lease terms, supplemental stipulations and state laws. Additional soils information is needed such as outlined under mitigating measures, in order to accurately determine measure for successful reclamation.

Comment: (p. V-41) The word "northeastern" should be changed to "northwestern."

Response: The text has been revised.

Comment: (p. V-45) The number "7" in the sentence, "An interruption to this trend occurs in sections 3 and 7 where a slight warping produced an east-west trending syncline of very small magnitude." should be changed to "11."

Response: The text has been revised.

Comment: The statement: "About 35 antelope have been living on the lease area. Their numbers have been decreasing slightly due to the human activity on the lease area." implies that close measurement of antelope activity in this specific area has been carried on for some time and that the cited correlation between this activity and human activities can be proven. A more accurate statement would be: "It is estimated that about 35 antelope could have been living on the lease area and that their numbers have been decreasing slightly."

Response: This area is important antelope range. The number of antelope may vary with the season of the year. The question of human activity causing fluctuations in numbers has been deleted from the text.

Comment: The last sentence of the second paragraph should be changed to read: "At the historical productivity rates, a total of 1,118 AUM's will be temporarily lost to mining but productivity will be improved from mining reclamation."

Response: The 1,118 AUMs on the lease area is a relative figure; it is now known whether there will be more or less AUMs available after mining. Improved productivity from mining reclamation cannot be assured. (See response under General heading of this volume.)

Comment: Show Jacobs Land Livestock Company as controlling 2,518 acres instead of 1,878 acres. Delete McKinzie's 406 acres.

The statement: "The only reliable method of obtaining a crop is with irrigation." implies that revegetation in this area can only be accomplished

with irrigation. To clarify this point, the statement should be: ". . . a commercially salable crop in this area. . . ."

Response: Text has been revised.

Comment: Life expectancy of the mine is 25 years instead of 22. At maximum production, 160 acres per year will be disturbed by mining instead of the 231 acres shown in the DES.

Response: Table 9 page V-59 of the DES shows a total of 297,986 million tons of recoverable coal. The production schedule as supplied by Kerr-McGee is as follows: 1977--1.2 million tons, 1978--5.0, 1979--9.2, 1980--9.6, 1981--12.6 and 1982--15.9 to end of mine life. From 1977 to the end of 1981 a total of 37.6 million tons will have been mined leaving an estimated total of 260.4 million tons (298 - 37.6). At production rate of 15.9 million tons per year, the coal will be exhausted in another 16 \pm years (260.4 \div 15.9), making a total estimated mine life of 22 \pm years.

According to information presented by Kerr-McGee, a total acreage of 4,960 acres is involved. If the total area is mined, surface disturbance would be 16.6 acres per million tons of coal mined (4,960 \div 298 million tons). However, it is not reasonable to assume that the entire area will be mined to obtain the coal so a figure of 14.5 acres per million tons of coal mined was utilized to calculate the surface disturbance; therefore the 231 acres utilized in the DES (15.9 x 14.5).

Comment: Change 4,352 acres to 4,960 acres in the second sentence and delete the words "to be mined."

The sentences on lines 3-6 should be changed to read: "Production will increase to 15.9 million tons per year in 1982 and not exceed this rate for the remainder of the mine life. An estimated 619 million cubic yards of

overburden will be handled over the life of the mine, instead of the 270 million yards noted.

Response: Text has been revised.

Comment: (p. V-97) Change the third sentence of the second paragraph to read: "The topography after removal of coal could be as shown in Figure 2."

Response: The text has been modified accordingly.

Comment: (p. V-99) Figure 2 shows the results of dragline stripping. Therefore, the word "possible" should be inserted before the word "Topography" in the title.

Response: The text has been modified on page V-97 and V-100 to draw attention to "possible topography."

Comment: (p. V-100) The first and second paragraphs do not accurately describe either the existing topography or the options after mining. The following paragraphs should be substituted:

North Prong Creek will be diverted and altered to a minor extent. Its present, shallow, steep-sided, meandering channel will be changed somewhat and the new channel of the creek may appear to be flatter and straighter after mining.

If the topography is as shown in Figure 2 at the completion of mining, the remains of the highwall will be visible on the north side of the mined area.

The highwalls as illustrated in Figure 2 have not been reduced so this mine pit will create a long, narrow, trough-like depression which can be as a reservoir and will probably be the most visible indication that the topography of the area has been altered.

Response: The text has been modified.

Comment: The sentence: "It could result in bringing material to the surface which may be toxic (boron) to plant growth" is a double presumption without substantiation and should therefore be deleted. No toxic material exists in the overburden, according to completed analyses. Also, the company's reclamation plan indicates that all toxic material will be buried.

Response: The analysis of overburden shows the presence of toxic elements in the area. Reference for toxic material levels for man and animals (see pages 178a thru 1, Volume I) has been added to the FES.

Comment: (p. V-102) Construction of mine facilities will not permanently remove 200 acres of soil from productivity because, after mining is completed, the company will remove facilities not usable for ranching operations and reclaim the area. The first full paragraph should be corrected to indicate this fact.

The paragraph, starting at the bottom of page V-101 and describing possible effects of alteration of the channel of North Prong Creek is unduly alarmist because the North Prong Creek will have only a very minor realignment. The following sentence should be added to the end of the paragraph (page V-102): "However because only minor realignment of the creek channel is planned, the impact should be negligible."

Response: If coal leasing continued in this area, the mine site might be used for many more years than 25. Also it would probably require several years to remove the site facilities and reclaim the land upon completion of mining.

It is not considered to be a minor impact on North Prong with construction of road, rail spur and powerline in the area (refer to Part VI, Chapter III, Page VI- 74 paragraph 1).

Comment: (P. V-103) The statement is made that "small amounts of sand and gravel potentially useful for aggregate" could be lost along North Prong Creek. Since the amounts of sand and gravel which could be lost are small and since large amounts of sand and gravel for aggregate purposes will need to be imported, as discussed in Part I, Chapter V, the impact of possible loss of these "small amounts" of sands and gravels would be minimal, rather than "critical" as indicated in the next to last paragraph.

Response: The text has been revised.

Comment: (P. V-104) Overburden yardage should be shown as 619 million cubic yards.

The following sentences should be added to the first paragraph to give balanced coverage: "No aquifers are known to discharge into streams on the Kerr-McGee property and the North Prong Creek will have only a minor realignment."

Response: Partial changes have been made on page V-104.

Comment: (P. V-105) Spoils are more permeable after mining if the surface is treated properly through topsoiling and manipulation. Therefore, the beginning of the paragraph under the title "After reclamation" should be changed as follows: "Replacement of spoils into the pit could result in deposits with reduced permeability but spoils are more permeable after mining if the surface is treated properly through topsoiling and manipulation. With improper treatment, reduced permeability may . . ."

Response: Surface treatment of spoils will make the upper few inches, or possibly few feet, more receptive to infiltration of water with consequent better vegetative cover. However, surface treatment of the spoils will have no effect on the lower part of the backfill deposits.

Comment: (P. V-11) The partial paragraph at the top of the page refers to a "Part I, Chapter III, Reclamation of Mined Lands," which is not in the draft impact statement. Also, the negative inference against successful reclamation is unsubstantiated. Therefore, this partial paragraph should be deleted.

Response: Refer "Part I, Chapter III, pages 78-79 the word "Reclamation" has been changed to "Rehabilitation". It is a subsection under "Mining Operations."

Comment: (P. V-111) The figure 270 million cubic yards should be changed to 619 million cubic yards.

Response: The text has been revised.

Comment: (P. V-115) The year "1979" should be replaced with the year "1982."

The sentence: "In all probability the increased human activities and noise associated with mining operations will disturb and cause the major wildlife species to leave the area prior to destruction of the habitat . . ." is not supported by the evidence and should be removed. Testimony by a representative of EXXON Highland Uranium Mine indicated that animals do not leave the unchanged area during mining operations and that during the hunting season the animal population increases in the area of the mine.

Response: The text has been revised.

Comment: (P. V-116) The statement: "No satisfactory evidence is presently available which would suggest that strip mined areas can be satisfactorily revegetated with plant communities that will satisfy needs for deer or antelope" is contrary to experience with mining operations in the State of Wyoming, including Kerr-McGee's Shirley Basin operation, where antelope have been seen grazing on revegetated land.

Response: The presence of antelope on an area does not necessarily mean that the area provides their habitat needs.

Comment: (P. V-118) Add the following sentence to the last paragraph:

"Also, the Jacobs Land and Livestock Company will use the inactive portion of the lease for grazing purposes while the mining operation is in progress."

Response: Jacobs Land and Livestock will use undisturbed areas until mining reaches that point.

Comment: (P. V-121) Delete the third sentence of paragraph two and substitute: "Covered storage will be used for coal and the length of time that coal will remain in storage will be minimized." Also, add: "Dust collector systems will be used on the overburden drills."

It should be noted in this discussion of "Mitigating Measures" affecting air quality that water systems and dust suppression systems will be used wherever possible to keep air pollution to a minimum; that pollution will be confined to a relatively small area in the mine vicinity, and that every reasonable effort will be made to keep accidental coal fires to a minimum to prevent loss of coal as well as in the interests of air quality.

Response: The reference made in the mitigating measures is identified in the event that extra storage piles are used. It is already stated in the mitigating measures.

Comment: (P. V-122) Last two paragraphs contradict each other. Delete the last paragraph.

The highwall plan should be stated as it is on page V-13, next to last paragraph.

Add the following statement to the end of the second paragraph: "Grading and shaping will include methods of water retention and erosion prevention such as scarifying, ripping and discing."

Response: This paragraph complies with the present requirements of the federal agencies involved. Text has been modified as suggested.

Comment: (P. V-134) Mitigating measures for recreation are not discussed as a separate section in Chapter IV although the Table of Contents indicates that they will be. A separate section on recreation should be included.

Response: That page was left out and has been included in the FES.

Comment: (P. V-135) It should be noted in the mitigating measures for agriculture that Kerr-McGee is planning to use a truck-shovel operation which will allow rapid reclamation and revegetation.

Response: This would not change the mitigating measures of prompt reclamation. It is a way of attaining it.

Comment: (P. V-136) It should be noted that existing public access roads will be maintained as mining progresses throughout the affected area. This will be accomplished through scheduled relocation of roads in cooperation with state and county highway officials as well as local residents. Construction of relocated roads will reflect existing state and county design and construction schedules and specifications.

Response: This is noted in the DES. There appears to be no difference between the comment and the text as written.

Comment: (P. V-139) Change the last sentence to read: "Some change in the drainage channel of North Prong Creek cannot be avoided, but the realignment will be minor."

Response: The text has been revised.

Comment: (P. V-156) Add the statement: "For the quantities and tonnages to be moved throughout the mine life and the distances involved, truck transportation is estimated to be so costly that it is not an economically viable alternative."

Response: Text changes have been made to indicate that truck transport is most likely to be used between mines and railroad loading points.

Comment: (P. V-161) The statement: "Wildlife habitat for those animals which depend on the sagebrush type habitat will be destroyed for a period of 20-50 years." is inconsistent with the experience in Shirley Basin where sagebrush is beginning to revegetate naturally after only two or three years.

Response: Based on revegetation of old fields in the area, it will take 20-50 years to get approximately the original stand of sagebrush.

33. Mr. and Mrs. Richard J. Ball

No response required.

34. Black Hills Power and Light Company

The comments concerning emission controls and Neil Simpson emission data used also made at the hearing and answered under that section.

Comment: Throughout the report, our coal mine is referred to as Wyodak Resources Development Corporation. Please change Wyodak Resources Development Corp.

Response: In its mining and reclamation plan dated December 1973, the company refers to itself, even on the title page, as Wyodak Resources Development Corporation. Further, Federal Coal Lease Wyoming 073289 is held in the name of Wyodak Resources Development Corporation. Where possible changes have been made in the text.

Comment: Page VI-31, first paragraph, change figures to read" . . . and a weight of 1,742 short tons per acre-foot. . . . federal lease would be 34,969,000 short tons . . . thick coal in the south pit area (24,412,000 short tons) . . . reserve of coal would be 59,381,000 short tons . . . mined out leaving a remaining reserve of 52,798,000 tons . . . coal reserve in the south pit area is about 50,158,000 short tons . . ."

Response: The paragraph has been rewritten using more generalized figures and allowing for burned out areas and non-recoverable coal.

Comment: Page VI-31, add the following to the end of the first paragraph " . . . assuming 95 percent recoverability, if total area were continuous without areas of burned out coal which amount to approximately 10,000,000 short tons."

Response; The text has been rewritten to allow for burned out areas in reserve figures.

Comment: In tabulation on Page VI-4 in first column (entitled "Surface") the figure following Wyodak should be 280 and the total 440. In the last column (entitled "Coal) the figure following United States should be 240 and that total 440.

Page VI-6 first line in second paragraph, change location to "NE $\frac{1}{4}$ SE $\frac{1}{4}$ of section 28 . . . " Same page, last line change "380" to "450."

Page VI-7, heading in tabulation should be changed from "Million Tons" to just "Tons."

Page VI-10, third paragraph, third line, change to read " . . . additional drop-bottom or end dump trucks . . . "

Page VI-10, fourth paragraph, third line, and Page VI-14, fourth paragraph, fifth line, change silo size from 14,500 to 15,200 tons.

Page VI-17, tabulation, last column, following "front-end loader" change Hough "700" to Hough "400" Following 70-ton trucks, name in last column should read "Caterpillar '768'."

Response: The text in the FES has been revised.

Comment: Page VI-30, second line should read " . . . upper bed averages 52 feet thick and the lower about 32 feet thick . . ." (These figures are reversed.)

Response: The text has been modified.

Comment: Page VI-30, second line from the botto figure should be changed to "40 million tons."

Response: The statement has been expanded to include recoverable coal on all three leases, thus, the figure 160 million short tons has been inserted in the text.

Comment: Page VI-31, second paragraph should read "Federal coal lease . . . 80 feet of coal and the same weight, 1,742 tons per acre-foot . . . area of the north pit is 11,101,000 short tons. About . . . remaining reserve is 10,223,000 short tons; remaining recoverable reserve is 9,712,000 short tons . . ."

Response: The text has been modified to reflect the latest available data.

Comment: Page VI-38, under "Water Use," second paragraph, first line, change "cooling towers" to "condenser cooling."

Response: The change has been made in the FES.

Comment: Page VI-54, first paragraph, fifth line should read ". . . acres in the mining plan, Homestake Mining Co. owns 1,200 acres, Wyodak owns 280 acres, the State of Wyoming owns . . ."

Response: The text has been changed.

Comment: Page VI-54, second paragraph, third line, change "Wyodak" to "Homestake Mining Co."

Response: The text has been revised.

Comment: Page VI-54, third paragraph, third line, add at end of sentence
" . . . owned by Wyodak and Homestake Mining Co."

Response: The text has been changed.

Comment: On Page VI-69, first line of new paragraph, change "345KV" to
"230KV."

Response: Text has been revised.

Comment: Page VI-79, second paragraph, 7th line, change "more" to "79
acres of."

Response: More is changed to "79 acres of" on page VI-79.

Comment: Page VI-90, under "Farming," we suggest that paragraphs 3 and 4
be deleted and the following substituted: "The area adjacent to the mining
operation is mostly ranch land. For many years a very satisfactory relationship
has existed between the mining operation and the ranchers over fences, live-
stock control, access to ranching areas, etc."

Response: Paragraphs 3 and 4 under Farming, Page VI-90, explain the probable
impacts if no mitigating measures are taken. Mitigating measures are discussed
under Farming on Page VI-III.

Comment: "Page VI-92, second paragraph, change "\$25 million" to more than
"\$160 million."

Response: The text has been changed to "approximately \$160 million."

35. Environmental Defense Fund

The majority of the comments raised by this letter were also raised at the
hearing and responded to under that section.

Comment: In addition, the discussion of water quantities is inconsistent and confusing. On page I-55, it is stated that the estimated water demand for the "study area" is approxiamtely 50,000 acre-feet per year by 1990. If the authors had examined the water contracts and applications even of the few companies whose proposals are considered here, they would quickly have realized how low their water estimate is.

Response: The water quantity on page I-55 is based on the projected development for the study area as detailed on p. I-56. Average water requirements per type of facility were used and these are shown on page I-57. Based on the present information concerning development plans up to 1990, 50,000 acre-feet is the estimated additional water need. Many of the companies have purchased, or are trying to purchase, rights to a larger volume of water. However, in all likelihood the water may not be used within the study area and also much of the purchasing is speculative. The companies are attempting to tie up water rights while they are available for purchase regardless of the projected immediate need for such water.

36. Eileen Dunnebecke

No response required.

37. State of Wyoming

In preparing responses to comments raised by the State, the order of response is changed from the format as officially submitted. The change was made in order to facilitate the State of Wyoming's review of the final EIS. The state departments raising the comment are not identified since the comments were treated in their entirety as a State submission. The order proceeds from the general comments each department had to comments by volume, with only a few exceptions.

answered will not be repeated. This is especially true in the case of the comments expressed by the State Department of Agriculture. Many of its comments were duplicated by the Wyoming Farm Bureau Federation (letter #27) and responded to under that letter. Also many of the comments and issues raised in the state submission were brought out at the various hearings and have been answered under that section of this volume.

Comment: There seems to be a disparity of figures scattered throughout the Draft Environmental Impact Statement which misleads the reader. For example, on page I-459 it is stated that "12 new coal mines, 4 power plants and 2 gasification plants will be on line by 1990." Then on page I-514, a statement reads that "11 new coal mines, 2 power plants and 2 gasification plants will be located in the Powder River Basin by 1990." It leaves one with the feeling that the authors don't really know what development is going to occur.

Response: Upon reviewing page I-459, the statement quoted above cannot be found. The statement on page I-459 discusses the total projected development to the year 1990 based on plans indicated by industry.

Comment: Several very difficult problems of economic analysis are not addressed adequately. The uncertainty of the eventual spatial pattern of settlement is assumed away. The extreme demands that rapid growth will place on labor supply is not treated adequately. The difficulty of predicting the precise age characteristics of the immigrants, and thereby the demands they will place on service delivery systems is not addressed. The discussion of culture and lifestyle is filled with generalities and undefined terms, and is not very enlightening. Assuming that policy objectives in this area would center around preserving desirable aspects of present lifestyles and minimizing conflict between new and old residents, much more must be done in this area than has been done here.

Response: There is indeed a good deal of uncertainty regarding spatial population settlement; therefore we were forced to assume settlement patterns

would occur similar to patterns that existed in 1970. No one can confidently predict spatial distribution 15 years away particularly when faced with lack of precision in industry plans. Shortage of available labor is not ignored and was discussed in terms of the apparent inability to satisfy the need for labor, particularly in the construction sector.

One cannot predict with any degree of reliability immigrant characteristics and thus their service demand when no one admits to having any idea as to where a good percentage of the needed labor force will emigrate from.

Our discussion of lifestyles is based on what informational studies and opinions were available to us. We certainly admit to a paucity of available information and imperfect knowledge in this field.

Comment: The section on housing in Volume II is generally a presentation of the obvious. It seems necessary to review housing conditions in 1974 to gain knowledge of the current market conditions.

The importance of mobile homes is under emphasized. The writer is apparently not in favor of them as a housing alternative.

Response: Our discussion on housing was based on the latest information available to us at the time of its preparation.

The text has been revised concerning mobile homes.

Comment: In Volume II, Chapter VI, "Significant Mitigating Measures" as well as in other areas of the Environmental Impact Statement, there appears to be almost total disregard for the provisions of Article 4, Land Quality, of the 1973 Wyoming Environmental Quality Act.

With respect to mine land reclamation and the impacts to be experienced regarding all aspects of the proposed mining operations, the provisions of Article 4, Land Quality, of the 1973 Wyoming Environmental Quality Act, present

as much as significant mitigating measure as any of the provisions presented concerning federal control. It is felt that more consideration should be given to the provisions of Article 4 in minimizing the immediate impacts of the mining operations on the topography, soils, mineral resources, water resources, vegetation, archaeological, paleontological and historical values and aesthetics. It is also felt that perhaps some space should have been provided for elaboration on possible avenues of state-federal cooperation in controlling mine land reclamation and eliminating or minimizing the impacts described.

Response: Volume II, Chapter VI, "Significant Mitigating Measures" specifically cites on pages I-612 and I-617 the Wyoming Environmental Quality Act of 1973. All energy development activities within the State of Wyoming must meet the minimum requirements of all Wyoming laws. If their operation is regulated by Federal lease or permit, they must also comply with all Federal regulation. They must also comply with the most stringent regulation, regardless of who administers it.

Comment: This draft statement gives little consideration to applicable State Water Law with regard to interference with existing water rights, both surface and ground water, from mining activities or the necessity for securing water right permits when water is to be impounded or utilized for either surface or ground water sources.

Response: Page I-618 has been modified.

Comment: Mention is made several times throughout the draft statement of the requirement for the installation of hydrologic monitoring wells along with pumping tests and the installation of surface water pumping tests to determine the affects of the mining activities on ground water aquifers and both ground water and surface water quality and quantity. Since both the Wyoming State Engineer's

Office and the Wyoming Department of Environmental Quality have responsibility in the area, monitoring activities should be coordinated with the appropriate agency.

Response: Page I-618 has been modified.

Comment: No mention is made in the chapters on "Mitigating Measures" of the fact that under Wyoming water law it is possible to change the location of a well, a reservoir or irrigated lands that are affected by such activities as mining. This would prevent the loss of these facilities and of irrigated lands, in many instances, and reduce the impact of the mining activity.

Response: The FES has been revised to reflect this.

Comment: The final statement should also address in a general way land use and transportation needs of the Powder River Basin communities and the associated impacts.

Response: The DES has addressed land use in a general way by estimating certain land requirements for utilities, roads, industrial sites and urban expansion as it addressed certain basic transportation needs such as road maintenance. For the purposes of this study, this basic analysis of land use and transportation appears to be adequate.

Comment: That wherever applicable in the report the wording be altered to more properly reflect the State's role of responsibility and authority; and further to portray in a more discernible fashion the land management role provided by Wyoming's constitution, its laws, and its administration.

Response: In the rapidly developing areas of environmental quality regulation and enforcement it is difficult to tightly define the relative roles of state and federal agencies. Several changes to the text have been made in response to specific suggestions, e.g., pages I-11, 12, and 13, and a new section to reflect the role of the state has been added on page I-621a.

Comment: No assurances are given in the report on how wildlife will be compensated for in loss of habitat.

No assurances are given in the report on what percentage of reclaimed land, if any, will be done to benefit wildlife rather than domestic livestock.

Response: Refer to Assumption and Analysis Guideline No. 3, Volume I, page I-59.

Comment: More emphasis is needed on loss of hunting. No mention is found of quality of hunting, more hunters in the field, competition for places to hunt, reduction in available antelope permits, eventual deer permits if hunter success is to remain above 50%.

Response: The subject was quantified and discussed in Part I, pages I-537-538.

Comment: No mention is made in the DES of the necessity of increasing the number of game wardens which will be needed to enforce the game and fish laws of the management personnel to more intensively manage the fish and wildlife resources. The enforcement of game and fish laws will be especially critical during the construction phase of development due to the transient nature of construction workers.

Response: It is believed that it is safe to assume that the magnitude of increasing demands on law enforcement agencies in general is adequately portrayed through our analysis of city police and sheriff departments. Other enforcement agencies can assume similar demands without explicit acknowledgement in the study.

Comment: The most critical impact on all wildlife which was not mentioned in any of the fish and wildlife sections that will be posed on the mine sites is the effect of water table lowering on seeps and springs within a 6-mile radius of each of the mine sites. With pollution of the streams adjacent to the mines that

will probably occur, drying up seeps and springs in this large an area will, in effect, de-water four entire townships surrounding each mine site.

Response: Most effects will be west (down dip) of the mine site. The 6-mile distance from the mine site is considered to be the maximum distance of any measurable effects under the assumed conditions. Most of the effect (lowered water levels) will be in the near vicinity of mine operation.

Potential impacts to fish and wildlife resulting from water changes were discussed in a general fashion at numerous points in the draft EIS. Example pages include C-38 (Paragraph 2), C-39 (Paragraph 1,2), C-40 (Paragraph 2).

Comment: A general statement covering all recreational, historical, and archaeological aspects of this entire study area should be set forth which specifies that all possible consideration will be given to the protection and development of known, discovered or developed recreational, historical and archaeological resources within the study area.

Response: Where the basic management authority of federal and state government provides for protection and development, emphasis was not necessary. Where more specific statutory authority placed additional responsibilities upon government, i.e., Historic Preservation Act and the Federal Highway Act of 1973, emphasis was made in Part I, Pages 637-641.

Comment: (Volume I, page I-5, last paragraph, last sentence) Where did the figure of 5 million tons come from? Best information we have is approximately 2.5 million.

Response: The mining plan submitted to the U.S. Geological Survey indicates that coal production will be expanded to five million tons per year by 1982 to satisfy the fuel requirements of power plants within the Black Hills Power and Light Company system.

Comment: The second sentence of the second paragraph on Page I-11 mentions that the "Clean Air Act requires that any entity proposing a new industrial facility (power plant, gasification plant) must obtain a permit certifying that the plant complies with EPA's new source performance standards."

Gasification plants are not included in the 13 categories for which new source performance standards are specified.

Response: Only the companion power plant of a gasification plant would be subject to NSPS. This section has been modified.

Comment: (Volume I, page I-11) Any facility having the potential to cause the issuance or an increase in the issuance of air contaminants must obtain a construction permit from the Wyoming Department of Environmental Quality.

Operating permits are also required of all mobile sources and permanent sources after an initial 120 day start-up period. Reference: Wyoming Air Quality Standards and Regulations, 1974, Section 21 (a).

Lines 8 and 9 say that "EPA effluent guidelines and standards determine whether any specific permit may be issued." Permittees must comply with state and federal standards, and in the case of operating permits, the EPA does not have a similar requirement on the federal level.

Lines 9, 10 and 11 mention that it is possible for delegation of authority from EPA to Wyoming. The Wyoming Environmental Quality Act grants authority to the Department of Environmental Quality to institute permit systems in air, land and water quality matters. Compatibility with the coverage of EPA's permit system gives the state the prime responsibility and authority in the air and water permit programs, but the last sentence, (lines 11 and 12) is accurate.

Response: The section to which these comments refer deals with the role of federal agencies, this paragraph specifically with the Environmental Protection Agency. The role of the Wyoming Department of Environmental Quality is found on

the following page, I-12. That paragraph has been revised to reflect comments offered, but no change of the paragraph on page I-11 seems warranted.

Comment: (Volume I, page I-12) This statement infers that State agencies have incomplete or indefinite control over the development described. We do not agree with the implication that there is a lack of State authority and control over developments set out in the Impact Statement.

State agencies have definite authority under State law, and while there may be overlapping Federal-State authority, the State nonetheless has specific and definite jurisdiction and control over vital elements of development.

The first sentence under heading "State agencies" is an example of the condescending tone referred to in the general comments.

Response: Both comments refer to the same sentence; it has been revised in the FES.

Comment: (Volume I, page I-12) The Environmental Impact Statement indicates the following: "The Land Quality Division issues permits and licenses to mine upon its approval of a mining and reclamation plan submitted by the applicant. Licenses to mine may be revoked or suspended for substantial violation of their terms. Regulations under the Act, which became effective July, 1973, have not yet been issued."

The second draft as amended of the regulations to accompany Article 4 of the 1974 Environmental Quality Act have been made available for public review. Public hearings concerning the regulations will be held July 29 and 30, 1974, in Casper, Wyoming.

The following should also be indicated: each mining permit applicant must post a performance bond with the State of Wyoming in an amount determined on the basis of accepted engineering practices by the Land Quality Division for the purposes of insuring mine land reclamation.

In paragraph 2, under State agencies, lines 9 and 10 mention that permits and a license to mine are required. No mention is made of the requirement for a permit being required to engage in mineral exploration by dozing. Reference Section 35-502.31 Environmental Quality Act and the reclamation of abandoned drill holes as specified by 30.96.16 of the statutes.

Lines 12 and 13 refer to "regulations under the Act which became effective July 1973" This may have reference to Air Quality Standards and Regulations which became effective on June 3, 1974, and which are "issued" for general distribution. Land quality regulations scheduled for public hearings in late July 1974 will be adopted and distributed soon thereafter.

Response: This paragraph has been revised in the FES.

Comment: (Volume I, page I-13) This paragraph is incomplete since it does not indicate that the Board of Control is responsible for amendment or transfer of existing water rights which are of an adjudicated or "finalized" status. The Wyoming State Engineer and the Wyoming State Board of Control administer State water laws which regulate use of surface and ground waters of the State. Applications for new water rights are filed with the State Engineer and petitions for transfer of existing water rights with the State Engineer or the Board of Control depending on the Status of the existing rights. Requests are normally approved if it is determined that approval will not jeopardize prior water rights.

Response: Paragraph on page I-13 in the FES has been revised.

Comment: (Volume I, Page I-18) In the tabulation of Campbell and Converse County acreage, the total acreage for each differs significantly from figures published in the Wyoming Data Handbook (1973). Your figures are 9,126 acres high on Campbell County and 87,836 acres high on Converse County.

Response: The text has been revised to use the suggested data.

Comment: (Volume I, Page I-21) Figures of 12.4, 13.3 and 36.5 billion tons should be documented. There are published reports that do not agree with these figures. e.g. Glass-Coal Age-Mid April 1973. "Economically strippable coal reserves -- " should be defined.

Response: These estimates were derived from the latest information available from unpublished drafts of the Northern Great Plains Resource Program and refer only to the economically strippable recoverable coal reserves. The text has been changed to indicate that recoverability is taken into account. Economically strippable coal reserves are those known coal reserves which can be recovered at a reasonable profit within the limitations of the "state-of-the-art" of mining technology.

Comment: (Volume I, page I-22) In the second paragraph, second sentence, -- Sentence has no meaning and needs to be qualified.

Response: The strippable reserves and coal resources of the study area are so large that they are capable of sustaining most mining and coal demands levied now and for many years in the future. The sentence has been revised.

Comment: (Volume I, page I-22) In the second paragraph, first sentence, the word "opencast" tends to confuse the reader. What does it mean?

Response: There is no intention to cause confusion by use of the term "opencast method". The open cast method, a term in common use in the mining industry, is a specific surface mining method which will be employed in the mining of coal in the Eastern Powder River Coal Basin. The term is defined in the glossary of the Draft Environmental Statement on page B-6, line 3 of Volume V, as: Opencast method. A mining method which consists in removing the overlying rock or overburden, extracting the coal, and then replacing the overburden.

The sentence in the text has been revised.

Comment: (Volume I, page I-27) The pie diagram indicates that Wyoming has 31% of the strippable coal in the nation. More recent publications by the Bureau would show a lower figure.

See more recent U.S. Bureau of Mines estimates published in 1973 and correct the spelling of "Liginite" to Lignite.

Response: The diagram does not add a great deal to the text and has been deleted.

Comment: (Volume I, page I-29) Figure 2 fails to show two coal mines and one electric generating plant north of Sheridan. The present map is misleading. If you do not mean to include data in the western half of the basin, then don't show the map area. Otherwise, indicate all the data as the caption indicates.

Response: Figure 2 has been revised to indicate the facilities shown are only for the study area.

Comment: (Volume I, page I-37) Table 4--what other mines are included. Table 3 page I-36 represents less than one-third of cumulative total for 1980.

Response: Table 3 as the heading indicates is for 4 mines only. Table 4 has been revised to reflect that it is for the total projected development in the study area.

Comment: In the first sentence at the top of page I-39, "Originally, all coal mined. . . ." is not a true statement. The Best Coal Mine was developed for a domestic market, not a power plant.

Response: The text has been revised.

Comment: (Volume I, page I-52) Table 5 - The Reservoir Evaporation figure is questionable--what reservoirs will contribute to this evaporation?

Response: The evaporation figure is an estimate. It was based upon evaporation from the thousands of stock ponds that exist throughout the area, and from Keyhole Reservoir and Gillette Fishing Lake.

Comment: (Volume I, page I-53, last paragraph) While water for Panhandle Eastern's proposed reservoir might be physically diverted from the North Platte River, it would not be appropriated from that source most of the time since only rarely is there water available over and above that necessary to satisfy existing water rights. Water would instead come from transfer of irrigation rights or water from other sources.

Response: Source(s) of Panhandle Eastern's water supply have not yet been firmed up. The possibility of the company obtaining Platte River water will probably depend on the results of pending court action.

Comment: (Volume I, page I-59) A reclamation schedule should be shown for proper restoration to wildlife habitat similar to the schedule for livestock in number 6. Available information indicates that a rehabilitation schedule for wildlife habitat, either for terrestrial or aquatic wildlife, would require a longer term commitment including water rights.

Those areas scheduled for planting as wildlife areas should be protected from livestock grazing. The amount of AUMs available should be determined on all reclaimed land before livestock grazing occurs. The number of acres to be reclaimed for wildlife should be pre-determined by mining companies in the planning and permitting process.

Response: A reclamation schedule for wildlife habitat was not shown since a basic assumption in the DES (Volume I, I-59, #3) was that attempted mined land reclamation would be primarily directed toward revegetation with grass species for livestock grazing. This appears to be a valid assumption in the regional context with the majority of the land surface under private ownership. At meetings with the DES team, three of the lease holding coal companies voiced intent to raise livestock on their private surface lands after reclamation. It

does not appear to be reasonable to dictate nonproductive land use for private surface ownership. To what extent, if any, it might be required that specific wildlife habitats be reestablished on state lands is unknown. Where federal surface lands such as those in the Thunder Basin National Grasslands are involved, reestablishment of specific wildlife habitats can be required (see Mitigation section for the Atlantic Richfield and Kerr-McGee leases.)

The reclamation schedule outlined for reclamation to livestock grazing land in Volume I, page I-59, is meant only to illustrate an absolute minimum time period before grazing could be feasible. It is agreed that a reclamation schedule for reestablishment of habitat for many of the native wildlife species, other than those dependent on a nearly pure grassland community would require a much longer term commitment. The points raised in the second paragraph of the comment are valid and should be considered in any wildlife habitat reclamation plan. However, it is believed that it would be inappropriate and misleading to include in the FES a wildlife habitat reclamation plan of the scope and detail necessary to be meaningful, considering that only a small part of the disturbed land may be subject to this objective.

Comment: (Volume I, page I-59, paragraph 2) The provisions of the Environmental Impact Statement are based on the assumption: "The level of mining technology will not change significantly through 1990." This assumption is not a reasonable assumption. This assumption should be explained as to basis. One would hope that mining technology will improve in the next 15 years.

Response: There are no known improvements in mining technology for coal anticipated in the near future. This is not saying that new reclamation techniques or coal conversion techniques will not be perfected. Regardless, it is an assumption on which the analysis was based.

Comment: (Volume I, page I-78, paragraph 3) The Environmental Impact Statement indicates the following: "No underground development or mining has been proposed for uranium, sand and gravel, bentonite, or clinker deposits in this area.

Exxon Uranium and Kerr-McGee have plans for underground uranium operations north of Douglas.

Response: The reference to underground development of mineral commodities other than coal includes the areas of the federal coal leases and proposed or active coal mines. The text has been changed to clarify this statement.

Comment: (Volume I, page I-112, I-114) Under the heading of Domestic and Construction wastes there appears to be an attempt to describe sewage systems and waste water treatment. The material is not very informative, does not stress requirements or controls to be expected. (Volume I, page I-114) This page has a statement indicating that waste from construction sites would be disposed of by open burning in remote areas. This practice is prohibited by Section 13 b (1) and (2), Wyoming Air Quality Standards 1974 unless special permission is secured from the Department.

Response: The purpose of the section is to describe in a general fashion various sewage and waste water treatment systems, not a description of specific systems to be used.

The reference to controls are particularly cited in Volume II, Chapter VI, "Significant Mitigating Measures." Air Quality standards and laws are presented on pages I-612 through I-616. Water Quality laws are cited on page I-617.

Comment: (Volume I, page I-115, paragraph 1, line 6) Should not the word "eastern" be "western" Wyoming?

Response: No. Pacific air currents drop much of this moisture prior to entering eastern Wyoming. Normally, Pacific air currents contribute less

moisture to eastern Wyoming, particularly the Powder River Basin, than to western Wyoming. Since the analysis is of the Powder River Basin in eastern Wyoming, the adjective is correct as stated.

Comment: On page I-135, Table 7, the power plant in the first half of the table is not identified. It must be Pacific Power and Light Company's Dave Johnston plant.

Response: Concur, it is PP&L's plant. The plant has been identified in the FES.

Comment: Some of the data contained in Table 7, page I-135, as given is not accurate.

Response: Data have been revised. Revised emission data included in the FES were provided by Pacific Power and Light and Black Hills Power and Light Companies (which differs with the revised Table 7 provided by Department of Environmental Quality, Division of Air Quality in the State letter of comments).

Comment: (Volume I, page I-144, paragraph 2 and page I-145, paragraph 1.) The compiled Soil Association Map of the Powder River Basin prepared by the U.S.D.A. Soil Conservation Service using existing information dating back to 1953 and yet interpreted according to modern classification concepts. The last sentence points out that this identifies an element of questionable accuracy in the basic soil association map. Yet, the U.S.D.A. Soil Conservation Service which is the primary federal agency to make soil surveys has since prepared a much better map and current data about soil composition in map units.

Response: The U.S.D.A. Soil Conservation Service supplied and correlated the county data that were available. The team then assembled the information that is shown in the text.

Comment: (Volume I, page I-181, paragraph 1, sentence 1) This figure of 610 billion tons of coal under less than 3,000 feet of overburden in the Powder River Basin of Wyoming is 65 billion tons higher than previously published estimates for the entire state of Wyoming at up to 6,000 feet of overburden. These estimates may be correct, but they have not been published in any report that we are aware of.

USGS Professional Paper 820, United States Mineral Resources 1973, on page 137 shows 120,656 million short tons of coal for Wyoming with 3,000 feet of overburden as of January 1, 1972.

Response: These revised coal estimates were compiled by Paul Averitt of the U.S. Geological Survey in 1973 during his research for the Northern Great Plains Resource Study. The source of the estimate is shown on Table 14, page I-182 in the DES. The table, or a modification of it, will be formally published by the U.S.G.S.

Comment: (Volume I, p. I-258, last paragraph) This paragraph comments on water rights but deals only with surface water. The control of ground water also rests with the State Engineer by statute. Another paragraph should be added to bring this out, or this paragraph should be added to page I-230 just ahead of the section labeled, Surface Water.

Response: (Page I-618, Chapter VI - Mitigating Measures) Volume II, has been modified to include statement that appropriation of, and supervision of ground and surface waters is under control of the Wyoming State Engineer and the Board of Control.

Comment: (Volume I, p. I-262) The North Platte River is not governed by Interstate Compact but is instead operated under terms of 1945 and 1952 United States Supreme Courts Decrees.

Response: The FES has been revised to reflect this.

Comment: (Volume I, page I-268-273) Throughout these pages and in discussing vegetation on each site analysis, big sagebrush is emphasized as the predominate vegetative species. For instance, paragraph 3, page I-273, big sagebrush/grass vegetation type is by far the most wide-spread community in the area, yet the last sentence states that the big sagebrush type occupies 4,188,000 acres. It appears vegetative types and sub-types are misnumerated and confusing. Big sagebrush is not the dominate vegetative species as it will make up less than 20% of the species composition with grass species at 60% and forbs and other plants the remaining 10%. The density of any species can vary on a specific area with these 4,188,000 acres, depending upon soils, grazing use, fires and so forth. Vegetative analysis statements and terminology should be consistent and reflect the inventory and use of vegetative resources in the environment, giving due weight to vegetative resources analyzed. Total impact of development cannot be adequately evaluated with misleading information.

Response: We concur with your observation; however, the only difference is we do not use percentages. For example, Big sagebrush, Type 4 - The shrub layer of the sagebrush/grass community is composed almost exclusively of big sagebrush. The density (plants/unit area) of the big sagebrush layer varies from a few scattered plants, with a predominately grass understory, to closely spaced or clumped shrub stands with little or no herbaceous understory. In the latter instance, crowns of individual plants normally do not touch.

Comment: (Volume I, page I-271, paragraph 1) Under the heading Sandhills Grassland, Type I C, the same scientific name for Silver Sagebrush, and Big Sagebrush, i.e., Artemisia tridentata is used. This is not correct. The scientific name for Silver Sagebrush is Artemisia cana. All scientific names

of plants should be cross checked with the "Standardized List of Weeds" published by the Weed Science Society of America. This aforementioned list is a commonly used list and should aid in correcting misspelled and inaccurate names.

Response: The text has been revised.

Comment: (Volume I, Chapter IV, pages I-290 and I-291; Volume I, Chapter V, pages I-509, and I-637 and I-656) These pages describe the sites which may have historical and archeological value and procedures to be followed by developers in considering such properties for minimizing adverse effects. No reference is made to the requirements of Wyoming's law, EQA Section 35-502.12 (a)(v), whereby the Environmental Quality Council designates "areas of the state which are of unique and irreplaceable, historical, archeological, scenic or natural value." The resolution (copy attached) passed by the Council on January 25, 1974 requires definite obligations on the part of developers to consider such areas. Mining and reclamation plans are reviewed in this regard by the State Recreation Commission, the Archives and Historical Department and the Anthropology Department of the University of Wyoming. Permit applicants are required to notify these agencies if archeological materials are encountered during the course of the operation. Reference to the above listed requirements should be included as a part of these chapters.

Response: Changes have been made in Volume II pages I-637-638; Volume III page II-135, pages III-132-134; Volume IV pages IV-132-134, page V-129-131, pages VI-101-103.

Comment: (Volume I, page I-323 - Table 28) The harvest information presented for deer for the year 1972 in the Northeast Region is incorrect. An additional 8,252 non-resident hunters were projected to have harvested an additional 5,826

deer above that which was published in the annual harvest report. The majority of these hunters and deer were projected in the Gillette area and Weston County.

Response: Table 28 has been revised in the FES.

Comment: (Volume I, page I-324) The first paragraph should be changed to show that "Whitetail deer are found in good numbers along the Powder and Little Powder Rivers within the study area." "and increased illegal killing" should be added after ". . . loss of habitat." "and the area's population is not stabilized." should be deleted from the second paragraph.

Response: The text in the FES has been revised.

Comment: (Volume I, page I-326) "Although not a threatening factor, the red fox is an important predator on the sage grouse and other birds in the area." This sentence should be added after "Red fox numbers are increasing."

Response: Text has been revised.

Comment: (Volume I, page I-331) It should be pointed out that the five to eight sage grouse per square mile is an average figure for the overall area. Certain specific areas contain a much higher density while others would be lower. The statement that no specific information about sage grouse wintering areas is not true. Due to the uniformity of vegetation and topography of the Northern Great Plains much of the sage grouse range is considered year-round range, which would include winter range. Winter conditions in the study area are usually not so severe that the birds have specific wintering areas. There are no significant migrations. In 1970, Bob Williams reported (Wyoming Game and Fish Department, Current Status and Inventory G3, 1970) the density of sharp-tail grouse in northern Campbell County to be approximately 7-10 males per square mile and approximately 4-6 males per square mile for central Campbell County. Assuming equal sex ratios, it would be acceptable to project sharp-tail population figures in amounts equal to 14-20 birds per square mile for

the northern part of the county and 8-12 birds per square mile for the northern part of the county and 8-12 birds per square mile for the central part of the county.

Response: The intent of the EIS is consistent with that of paragraph 1 of the above comment. Text has been revised. Available information regarding specific sage grouse winter range areas within year-long ranges is slight. The text has been revised to incorporate suggested sharptail grouse population estimates.

Comment: (Volume I, page I-333) "Low moisture is the major habitat limiting factor." The above sentence should be added with reference to wild turkey. Figure 64: Wild turkey populations for that portion of Converse County within the study area is estimated at 300 birds. This information should be included with a population figure for Campbell County and inserted into the report in place of "unknown".

Response: Text revised to incorporate most of above suggestion.

Comment: (Volume I, page I-339, line 8) Change "7000" to "9000" acre Keyhole Reservoir.

Response: Text revised.

Comment: (Volume I, page I-341) Line 5: Add the following non-game fish: sturgeon chub (considered rare and endangered), River carpsucker, plains minnow, silvery minnow. Line 7: Change to read "Stonecats, black bullheads and channel catfish are present. . ." Line 19: Others include, etc., add "smallmouth bass" after green sunfish. Line 23: Add after green sunfish "and smallmouth bass." Line 26: Add "northern pike" to game fish list.

Response: Text has been revised.

Comment: (Vol I, p. I-343) Little Powder River - We have not planted the headwaters of this stream since 1960. Other references to trout in this section of stream should be omitted.

Response: Text has been revised.

Comment: Volume I, p. I-347. The statement made that the number of upland game hunters in northeastern Wyoming is low should be clarified as to meaning that portion of Converse and Campbell Counties within the study area. The statement does not hold true for all northeastern Wyoming. "Sharptail" should be added to the list of upland birds in the fourth paragraph.

Response: The statement has been modified on page I-347 and "Sharptail" added to the upland bird list in the fourth paragraph.

Comment: Volume I, Chapt IV, p. I-350, Figure 66. Alcova Reservoir, Cook Lake and Antelope Butte Ski Area should be placed on this map.

Response: These sites have been added to the map.

Comment: Volume I, p. I-357 last sentence. This last sentence should read as follow: Keyhole, Glendo, Alcova and Guernsey Reservoirs offer good waterskiing when the water levels are kept to a compatible level. Probably the most significant problem affecting water base recreation is the Federal Government's apparent inability to significantly assist the State and County governments with the recreational administration and development of these Federally owned areas. A coexisting problem compounding this situation is the lack of minimum recreation pool levels at these locations. Water base recreation is sharply on the increase in these areas and without Federal assistance on these Federal lands, the State and County administrators may be forced to abandon these areas in favor of higher priority State and County owned areas.

Response: The first sentence will be added to P. I-357, the balance of the statement is self explanatory and a management problem for all agencies,

statewide; not a direct impact from development of coal in the Powder River Basin. The increased use of reservoirs in the basin may provide relief from this problem.

The dedication of reserves for new reservoirs is mentioned in Volume II, page I-541.

Comment: Volume I, Chapter IV, p. I-358, Fig. 72. Cook Lake should be located on the above mentioned recreation map and also by explanation below the picture. If Cook Lake is not located within the study area the picture should not be used.

Response: Cook Lake has been added to the recreation map (Figure 66).

Comment: Volume I, Chapt IV, p. I-360 paragraph 1. Antelope Butte Ski Area should be mentioned.

Response: Antelope Buttes Ski Area has been added to page I-360.

Comment: The statistics that have been put together are not as accurate as they should be. It is flattering to have all the land in one county considered "total land in ranches" however, "urban and built up areas" cannot be so considered.

The 1970 Soil Conservation Service's "Wyoming Conservation Needs Inventory" shows the figure of 56,411 acres as "urban and built up" for Campbell County and 37,595 acres for Converse County. Also Campbell County cropland is about 144,824 acres and Converse County cropland is 132,840 acres. Woodland or forested area in Campbell County is 35,646 acres, while in Converse County it is 125,207 acres.

The 1971 Wyoming Water Planning Program Report Number 7, "Irrigated Lands Inventory for Wyoming" shows Campbell County having 5,231 irrigated acres and Converse County having 46,820 acres.

Response: There are evidently inconsistencies between those data cited above and the data contained in the document. Data presented in the DES were based

upon reliable sources of information (Univ. of Wyoming, College of Commerce & Industry, Div. of Business & Economic Resources, Wyoming Data Book 1972) and are felt to reasonably depict the current situation. Text modifications therefore are not warranted. The "total land in ranches" is footnoted for explanation within the document.

Comment: (Vol. I, p. I-370, Table 36) January 1973 figures for cattle and calves are more accurate than the quoted figures. The heading "Sheep and Lambs" should be headed "Stock Sheep."

	CAMPBELL	CONVERSE	TOTAL
Cattle and Calves	84,600	82,600	167,200
Stock Sheep	121,100	119,100	240,200

Response: Text has been revised to include this data.

Comment: (Vol I, p. I-371 Para 2) The sentence beginning "Most of the hay is produced on irrigated meadows along the North Platte River . . ." is not accurate, since (a) the North Platte is not anywhere near Campbell County and (b) Campbell grows a good share of total hay production.

Response: This sentence may be somewhat misleading, but technically it is correct. Campbell County does produce less hay, but the difference between the two counties is not as large as may be implied. Since the reference is to the dryland farms in Campbell County and does not state that these are located along the Platte River the sentence is included in its entirety as stated in the text.

"Most of the hay is produced on irrigated meadows along the North Platte River and, to a lesser extent, on dryland farms in Campbell County."

Comment: (Vol. I, p. I-376, Table 40 and p. I-377, Table 41) This table should be revised to show current statistics and correct mistakes. The source

is the Wyoming Cooperative Crop and Livestock Reporting Service from whom Olson got his statistics.

Response: The changes noted with the addition of the years 1969 through 1972 do not appear to be sufficient to cause significant change in the analysis made of crop production.

Comment: (Volume p, P. I-379) Last paragraph, Second sentence, this sentence is incomplete, and the meaning is lost.

Response: Appropriate correction has been made in the text.

Comment: (Vol. I, p. I-389, para 3) The statement reading "Wyoming law defines unincorporated territory to include lands over one mile from the limits of a town or city having a population of one thousand or less, two miles from a town or city having a population between two thousand and three thousand, and three miles from the limits of a town or city having a population of over three thousand" applies to certain kinds of jurisdiction.

A recent Supreme Court opinion (Franklin Carter, et al v. The Board of County Commissioners of the County of Laramie, State of Wyoming, Jan. 1974) implies that the one, two and three mile jurisdictional clause applies only to sanitary facilities and not a comprehensive planning and zoning jurisdiction. Thus the counties would have regulatory powers in this disputed area for comprehensive planning and zoning and not the cities. The authority under Chapter 6.1, Title 18 (28-289.1 -- 18.289.9) WS 1955, as amended, is in direct conflict with 18-289.1 -- 18.289.9 as amended in 1967.

It is recommended that the above lines be stricken from the statement or clarified in writing so as not to mislead the reader.

Response: The text has been revised.

Comment: For the eight-county regional area, it is noted that only Natrona County and Campbell County have developed and adopted comprehensive plans. Johnson County has been working on the development of a comprehensive plan for the past two years. Only Natrona County has passed a zoning ordinance for a portion of the county. However Natrona, Johnson, Campbell and Sheridan counties have passed or are working on subdivision regulations, mobile home park codes and other land use control measures. Campbell, Natrona, and Johnson counties have active joint city/county comprehensive planning programs with resident planners and staffs on board. Glenrock, Douglas and Converse County have acknowledged their potential for a joint city/county planning office.

Much remains to be done in the area of planning for growth in the Powder River Basin. However, within the past two years, five of the eight counties have initiated planning activities of various degrees to meet impact development.

Response: The text has been revised.

Comment: (Vol. I, pages I-405-417) The housing characteristics presented have very little significance if not analyzed and compared with the U.S.

The analysis should concentrate on the financial elements which are likely to be and have been severe problems for the study residents.

Response: The analysis of the housing characteristics was done to evaluate the quality of housing within the basin and not to compare it to national housing quality and characteristics. Such comparison lends little to discussion on housing in the basin.

Financial elements of housing were discussed in Chapter V of Volume II.

Comment: (Vol. I, p. I-429 & I-430, Tables 60 & 61) These are 1972 figures and now could be changed to 1974 figures available in our 1974 Wyoming Health Profiles. This would require changing ratios of health manpower to population as described on page I-431.

The charts should be changed to reflect the current status of health manpower in the areas concerned, which would indicate a worsening of health manpower/population ratio.

Response: We have reviewed the figures presented in 1974 Wyoming Health Profiles, and they do indeed present some changes to data in Tables 60 and 61 of Volume I. In some cases the manpower improves and in some it worsens. However, the important point of this study is contained within the impact section (Chapter V) where projected manpower needs for 1980 and 1990 are displayed in Table 22 of that chapter. Even with the changes in existing manpower for 1974, the net effect on 1980 and 1990 manpower needs does not appear significant. For example, Campbell County had only five doctors in 1974 rather than the seven cited for 1970 in Table 22, Chapter V, which changes the net deficiency for 1980 and 1990 from 28 and 48 to 30 and 50. The change in impact magnitude is so small as to not warrant the revision of these tables and accompanying narrative.

Comment: (Vol. I, p. 342) Line 1--Should be "fathead minnow" rather than flathead minnow.

Line 2--After "With the exception of walleye, rainbow trout. . ." add "northern pike and smallmouth bass."

Line 5--Change ". . .with well over 7,000 surface acres" to "with about 9,000 surface acre."

Line 7--Gillette Fishing Lake - note that the deed was turned over to the City of Gillette on March 15, 1968. This transfer reserved water and area to recreation and fish and wildlife use subject to reversion for violation.

Line 13--Omit reference to brook trout introductions. i.e., "Occasionally brook trout are also introduced."

Response: Text has been revised.

Comment: (Vol. I, page 1-433, paragraph 1) The utilization rate figures appear to be inaccurate. Acute rates are lower in this area due to the lack of manpower which has an effect on the services provided.

The rate chart should be changed to reflect the correct rates. The number of beds is a poor indication of the services available to the residents of the area. One of the hospitals in the area is closed due to the lack of physicians. This should be indicated in the narrative.

Response: The FES has been revised.

Comment: (Vol. I, p. 1-433, para 4) The section on services should detail additional health services covering ambulatory care, emergency medical services, preventive medicine, and environmental sanitation beyond water and sewer data.

Include in this section obtainable data on above services from relevant state agencies or agency strategies for evaluating needs embraced within these service areas.

Response: It is not the purpose of the section to detail every conceivable aspect of health and medical services. We are interested in displaying the magnitude of impact on health and medical services in general rather than delving into all the categories of health and social services that may be available.

Comment: (Vol. I, pages 434-435) The discussion of mental health and alcoholism is very unclear. "Thus although Campbell County's mental health problems are substantially the same as in other areas of the region, the underlying causes are more readily identified." What does this statement mean? If two sets of circumstances ("boom" conditions in Campbell County versus "nonboom" conditions elsewhere produce identical results (i.e., mental health problems that are substantially similar), how can causation be assigned. Later, we are

told that "(as a relatively stable ranching area, the caseload in Converse County reflects the general composition of mental health problems throughout the Powder River Basin region." Since Casper is in the Basin, are we to conclude that mental health problems do not vary between boom and non-boom nor do they vary between rural and urban places (Natrona versus Niobrara).

Response: When taken out of context the first cited quotation is confusing and ambiguous. However, the problems and their causes are specifically enumerated within the paragraph. Both are assessments from the professional judgement and experience of local (Campbell County) health staff personnel. Identical mental health problems can result from different causes, the only difference possibly being the frequency with which they occur in the populace. The second quote has been clarified to specify Powder River Basin ranching area.

Comment: (P. I-455) "As dominance shifted still further, accommodation shifted from an attempt to assimilate the newcomers into the previous lifestyle to a process of amalgamation between the two opposing lifestyles." How has it been determined that there are two lifestyles? How do we know that they are in opposition?

"While Campbell County has been profoundly affected by mineral development, Converse and the remaining six counties in the basin area have remained relatively undisturbed. Ranching and its attendant lifestyle have retained economic and social dominance." Ranching is most certainly not the economically dominant in Natrona County. This statement is misleading as to the economic diversity of the entire region's economic structure.

Response: The piece on community attitudes and life styles is based on conversations with a social psychologist who has studied ramifications of boom

growth in Gillette. His impressions of such existing conditions have been reflected in this segment.

The text has been changed to indicate that Natrona County is not ranching dominant.

Comment: On page I-463, the last sentence of the second paragraph alludes to serious air quality impacts at Gillette and Douglas, but no definitive information is presented as to the predicted level of air quality impact.

Response: Lack of quantative information, including dispersion model pollutant concentrations from point sources, precluded more than a qualitative statement of air quality impact. The statement has been revised in the FES.

Comment: The third paragraph of Page I-467 discusses damage to plants resulting from SO₂ and cites such plant damage in California for comparison. In order to assess the possibility of such damage, a comparison of ambient SO₂ concentration is needed.

Response: Potential cumulative SO₂ concentration data for the study area have not been compiled so are not available for comparison. The discussion on page I-467 has been revised.

Comment: (Vol. II, P. I-483 Para 3, sentence 3) Should this sentence read "with difficulty" or without difficulty.

Response: The sentence should read "without difficulty". The text has been revised.

Comment: (Vol. II, P. I-491, first para) The second sentence of this paragraph is misleading. It is believed that the intent of this sentence is to give a general indication of the amount of water consumed by irrigation of 12,000 acres at a consumptive use rate of about 1.1 acre-feet per acre. (See I-546 and I-547)

Response: The FES has been revised.

Comment: (Vol. II, P. I-499) This statement would only be true if the coal seam to be mined is below the water table. This fact has not been established in the Environmental Impact Statement.

Response: Since mining will begin at or near the coal outcrop, and the coal can be expected to contain water (saturated) not far from the outcrop, it appears that the statement is correct.

Comment: Vol. II, p. I-499) The formation of acid waters from coal mining is not normally associated with the ph of the natural waters.

Response: Page I-499 has been modified.

Comment: (Vol. II, p. I-514) Last paragraph Sentence 1. On page I-355 the "red cinder cones" are considered as a Geological, Sightseeing experience. In this sentence it appears that this same red clinker does not exist in the present landscape and when used becomes an eyesore.

This section should at least acknowledge the existence of red clinker hills in the existing landscape.

Response: The statement in the FES has been clarified.

Comment: (Vol. II, p. I-537, Para 2) The figures in this paragraph are misleading and the facts should be restated.

Restate the paragraph thusly: "The total area of Campbell and Converse Counties is approximately 5.7 million acres of which 700,000 acres is federal land and 460,000 acres is state land. Most of the federal and state land is in scattered tracts, however, the national grasslands with 31,600 recreation visitor days in 1973 (344,000 acres) is the largest area of fairly well blocked federal land, with the remaining federal land (385,000) scattered as small isolated tracts." As can be seen some of the figures have been readjusted to current figures.

Response: The text has been revised.

Comment: (Vol. II, p. I-539, para 1) The following two sentences should be added to the last of the above mentioned paragraph: This water loss problem is clearly illustrated by Keyhole Reservoir which is presently being administered as a State Park yet approximately ninety percent of the water is available for sale to South Dakota. If such a sale should take place and the water taken, the State Park would be destroyed and one of the major water base recreation facilities in the study area would be lost.

Response: The statement is added to page I-539.

Comment: An implicit assumption about settlement patterns has been made that the ratio of rural to urban population will remain constant. This means that 22,000 people will be living in Campbell County outside the confines of Gillette. The reasonableness of this assumption should be examined. A similar problem arises in the case of Converse County.

A paragraph outlining the difficulty of predicting where people will choose to live should be added. This could be very important to towns on the edge of the development area, such as Moorcroft.

Response: Being unable to confidently develop new spatial distribution patterns for the incoming populace, the statement could only assume that settlement would resemble that of 1970. The statement has been revised to clarify this point.

Comment: "The county-by-county employment projecting figures assume the county of employment and residence are coincidental, but where anomalies in this assumption may exist they are pointed out." The anomalies with respect to commuting impacts on Sheridan and other Basin-edge communities has not been pointed out and should be.

Response: It is anticipated that the bulk of commuting will occur within counties particularly when considering that Buffalo and Sheridan are about 70 and 100 miles (one way) from the mines.

Comment: (Vol. II, P. I-583, and I-584, Para 4 and 1) The Department agrees that Campbell and Converse Counties will receive the most substantial impact from student enrollments. However, the area school superintendents disagree with the statement made on the above pages which says that "population increases due to coal and energy related developments in the region will have very minimal, if any, impacts on public education in these countries (sic)."

Response: The text has been revised.

Comment: In addition, it should be noted that the draft statement does not take into consideration projected economic development for the area that will occur on private land (e.g., the Texaco development in Johnson County near Lake de Smet). This development will also have substantial impact on schools and needs to be taken into consideration by local school people in planning school facilities and programs. For example, Mr. Rich Douglas, the Johnson County Planner believes that the school enrollment in Johnson County will increase by slightly more than 100% between 1974 and 1980 (the draft statement predicts a 53% increase due to development of Campbell County. He concludes then that school enrollments would far exceed the capacities of existing school facilities (e.g., he projects an enrollment of 1887 at the elementary level - present capacity is 800; 848 at the junior and senior high levels - 550 is the present capacity). In addition, Mr. Douglas predicts a steady increase in student enrollment through 1986 (the draft statement predicts a slight decrease in enrollment after 1980).

Response: The regional analysis in this report focuses primarily on coal related development on public and private land within Campbell and Converse Counties. Developmental activities outside of these counties may be indirectly affected, but the nexus is considered too remote and thus not germane to this report.

Comment: (Vol. II, p. I-618) Under the heading, Monitoring Program no mention is made of the monitoring network for surface waters.

Response: A number of streamflow gauges and water-quality stations are proposed for the area; only a few are in operation at the present time.

Comment: (Vol II, p. I-688) It is noted in the section on "Alternative Reclamation Objectives for Wildlife Habitat":

"Many wildlife species prefer areas with rough or significant relief containing lakes and reservoirs. Wildlife will also use areas having other types of topography with gentler relief."

This section does not, however, account for the need to maintain some of the abrupt topography relief conditions as exist in many of the outcrops that furnish essential cover and wildlife and for domestic livestock during severe storm conditions that are frequent in the Powder River Basin.

Response: It was considered in the statement that "many wildlife species prefer areas with rough or significant relief" although this was not stated concisely within this section.

Comment: (Volume II, p. 674-675) It is recommended that this section be deleted or changed to reflect a more realistic approach in dealing with impact growth problems. Coordination and cooperation between private industry community leaders, and all levels of government is the only possible means of achieving some resemblance of orderly growth.

Lack of communication between the public and private sector was listed as one of the major causes of impact growth problems that occurred in southwestern Wyoming in the last few years. It is unrealistic to assume that orderly growth and development will occur with 100% degree of success by any methodology or course of action.

Local control should be emphasized and improved with state and federal assistance wherever possible and feasible. Federal programs that would generate economic aid to impacted communities would play a more beneficial role in orderly development rather than through Federal land use controls and regulating efforts. Regulatory requirements should be maximized at the local and state level of government.

Response: A very important point of this alternative is that local control is emphasized. The alternative statement "development.....would be coordinated with the rate of social and economic development that could be sustained by the communities....." later is stated "this proposal would be purposefully directed toward coordinating community development capabilities with the rate of coal production." These very statements imply the need for coordination and cooperation between private industry, community leaders and government because as efforts are completed to accommodate growth then the rate of coal production could be expanded.

Comment: On page II-63, lines 3, 4 and 5, the correct designation is "South Fork Cheyenne River".

Response: The change has been made in the FES.

Comment: On page II-64, last paragraph, and page II-97, second paragraph, the right to the use of any water must be acquired by appropriation under State law where water is available or by "temporary use agreement" in areas where all water is already appropriated. This can be brought out by adding a phrase to the last sentence on Page II-64. This entire sentence should also be added to the second paragraph on Page II-97 after the word "railroad."

Response: These changes have been made in the FES.

Comment: (Vol III, P. II-107) Railroad to destroy or adversely effect 3,900 acres and result in an estimated loss of 75 antelope. This 75 seems too low. We would estimate 150 antelope displaced and lost. We will also lose production of those antelope for X number of years.

The loss of 10-20 deer is too low. We estimate a loss of 40 deer.

Response: We agree that the antelope and deer loss figures may be too low, especially if certain situations develop as a result of the railroad right-of-way fencing as discussed in previous responses. Since what will happen is not at all clear and other commentators have expressed concern that the big game loss estimates in the statement are too high, and the statement's concern for fencing effects too great, we feel that the figures used in the text are still the best estimates for the information available.

Comment: (P. II-123) "The projected railroad employment...is based on the employment projection model used by the...NGPRP." Several models were used by the NGPRP. Presumably the University of Wyoming Water Resources Research Institute model as applied by Matson and Studer is referred to here. The reference should be made more specific.

Response: The reference has been clarified in the text.

Comment: (Vol. III, P. II-141, First full paragraph, Line 3)

The right to the use of any water must be acquired under the appropriate provisions of State water law. The land owner will generally be involved in some manner, but this will vary according to the circumstances.

In the first sentence strike the words "without written authorization of the authorized officer or the landowner" and substitute the following after the word "facilities": except in conformity with State water law."

Response: The text has been revised as suggested.

Comment: (Vol III, P. III-138) Reno Reservoir is listed as 100 acres, however, we have it listed as 57 acres. When they replace it, it should be at 100 surface acres rather than 50.

Response: Concur on acreage figure. Original water right for this reservoir filing is: (12/11/50, 57.01 acres 424 acre-feet.) The reservoir is on private land and will probably be replaced at adjudicated water right.

Comment: (Vol IV, P. IV-74) The lease area is primarily within Antelope Management Area 17 - Gillette NOT 19 - Rozet as the report says.

Response: Text has been revised.

Comment: (Vol. IV, P. V-115) The following should be added: "Loss of winter range would eliminate an additional 30 to 40 antelope for a total of 65 to 75 antelope lost."

Response: The text has been amended to incorporate a portion of the above.

Comment: (P. VI-92) Mine employment for 1985 is given as 70 men. Since this mine will be producing 5 million tons by 1985 (p. VI-7), this is a gross productivity of over 70,000 tons per man year. This is a considerably higher estimate than other companies are making. Is it realistic?

Response: The employment figures do not include the present mine employment of 30, whereas the coal production figures include the output of these 30.

Comment: (Vol. V, Map 9) The color legend showing antelope winter concentration areas in the EIS is turned around. The light blue areas should be those areas known as winter concentrations. The dark blue areas should be other important areas.

Response: Map 9 has been corrected.

Comment: (Vol. V, Map 10) That portion marked lightly in red along the east side should be light green. That portion marked in red along the Belle Fourche River should have been dark green.

Response: Map 10 has been corrected.

38. Wyoming Sierra Club Group (Larry Edwards)

Comment: Your section on present regional air quality covered, in a very general way, meteorological factors relating to inversions and pollutant dispersion, but completely neglected factors controlling "collective" air quality--namely, wind direction and velocity and mixing effectiveness under various conditions.

Response: Except for surface wind data for Moorcroft, Wyoming (January 1950 to July 1952), there is little information on surface and upper wind direction and velocity for the study area. Lack of wind data precluded an analysis of "collective" air quality and mixing effectiveness under various conditions.

Comment: Inversion predictions are very disturbing, particularly since you:

1. did not present predictions for 1990 ambient air quality or for the ultimate development you would permit in the basin beyond 1990.
2. made no attempt to quantify future emissions from urban areas and highways.
3. have not gone to the detail of estimating realistic emissions, based on available control technology, for power and gasification plants, and presumably have done likewise with other factors effecting air quality.
4. have not considered all factors, as mentioned before, effecting collective impacts on air quality.

Response: Data from the study area are simply not available for estimating the cited omissions. To the extent of available data for the study area, qualitative and quantitative estimates have been made.

Comment: The problem with the EIS is that it does not apply information available by studying existing mining operations to estimate, for example,

dissolved solids originating from spoil piles and amount of silt eroded from mined areas by the wind.

Response: No data which would apply to strip mining in the Powder River Basin are available to estimate dissolved solids from spoil banks or the amount of silt that would erode from mined areas.

Monitoring programs combined with state and federal environmental acts are expected to control pollution of underground and surface waters.

Comment: Your estimates of water supply available to Powder River Basin industry require a serious re-evaluation and revision. It was stated that 100,000 acre-feet/year are unappropriated in the Green River Basin. Actually, only about 30,000 acre feet can be used. The purchase of 60,000 acre-feet of storage capacity at Fontenelle Res. from the Bureau of Reclamation by the state is currently pending, but information presented in a recent report by the Bureau of Sport Fisheries & Wildlife (Salt Lake City office) indicates that the sale and use of this amount of water would destroy the river fishery. Even if the sale is consummated, I am sure there will be a use for the water in the Green River Basin. Now I wonder how good your other water supply figures are.

Response: Interstate stream compacts allocate between 875,000 and 1,043,000 acre-feet of water per year to Wyoming from the Colorado River Basin, depending on hydrologic conditions of the future. Wyoming users presently consume 296,000 acre-feet of the above allocation; thus, between 579,000 to 747,000 acre-feet of water per year is available for other development. The Wyoming Water Planning Program of the State Engineer's Office has estimated that between 93,000 and 272,000 acre-feet of water per year could be utilized outside of the Green River Basin in Wyoming after accounting for projected water needs in that basin. The EIS team used a figure of 100,000 acre-feet of water per year and still considers that amount to be reasonable.

The purchase of 60,000 acre-feet of storage in Fontenelle Reservoir by the State of Wyoming has been approved, and contracts have been signed with two industrial companies for use of that water. In addition, an agreement for a second purchase of storage by the state is pending.

Comment: I am particularly dissatisfied with your cursory approach to solar energy. Your main concern seems to be to use it in central power plants, but it is most suitable for installation on individual buildings for space and water heating. Its use will reduce electrical loads and obviate the need for at least some coal gasification plants. Development of solar energy is far ahead of coal gasification. The two solar powered office buildings under construction (one by the Mass. Audubon Soc. is 8,000 ft²) might be considered pilot projects, along with many solar powered homes across the country. According to Earth News the Australian government has fostered solar development, and there are now 10,000 homes in that country using sunlight for hot water and heating. Larger units are being developed for factories and desalting plants. What is the current state of the art? How much less coal will the nation need if our government really pushes solar development for 5 or 10 years? What will be the effect of recent solar energy legislation? What is the difference in impact between coal and solar? These are questions you must answer.

Response: The draft statement notes that use of solar energy for heating and cooling buildings appears much more feasible than for power generation (top page I-851). As noted in the above comment and in the draft statement, use of solar energy is still in the research and development stage. Despite a large potential for future application, it does not appear to be a viable major energy source within the time frame of the present study.

39. The Wildlife Society, Wyoming Chapter

Some of the major points raised by this letter have been discussed under the hearing section or previous letters.

Comment. There is a lack of consideration of the legal requirements and responsibilities toward wildlife of mining companies destroying habitat in extracting federally owned coal. Such federal laws as the Fish and Wildlife Coordination Act, the Bald and Golden Eagle Protection Acts and Endangered Species Act, should be reviewed and a section included in the Environmental Impact Statement on how these Acts and others will be applied to surface mining.

Response: Of the acts referred to, only the Rare and Endangered Species Act of 1973 appears appropriate. That act is designed to protect rare or endangered species and critical habitat. "Federal departments and agencies shall take such action necessary to insure that actions authorized, funded or carried out by them do not jeopardize the continued existence of endangered species and threatened species, as defined by that Act or result in the destruction or modification of the habitat of such species which is determined by the Secretary of the Interior to be critical...." Available information and legal interpretations thus far have not indicated that the proposed development of coal in the study area will jeopardize the continued existence of an endangered or threatened species or result in the destruction or modification of a critical habitat.

In order to comply with the mandate of this Act, caution will be exercised in selling, transferring or approving actions otherwise substantially altering any lands in the study area until inventories and evaluations are conducted and it is reasonably certain that habitat for endangered or threatened species is not at stake.

Comment: To mitigate the adverse effect of railroad lines separating water sources from rangeland used by wildlife and livestock, new water sources, such as wells, should be included as part of the railroad line construction to provide water for wildlife and livestock.

Response: Replacement or development of water sources on lands other than federal surface, etc., will be subject to negotiation between livestock operators, the Wyoming Game and Fish Department, and railroad companies.

Comment: The Draft Environmental Impact Statement deals very little with the impact which will occur upon hunting and fishing by the increase in people in the area. Deer and elk populations are at their maximum population numbers. Presently, antelope are at higher levels than private landowners wish and antelope numbers will be reduced by hunter harvest. Habitat loss due to industrial development and increasing human populations will reduce the big game habitat carrying capacity, yet the demand for hunting will increase. In 1973, 74 percent of the deer hunters and 70 percent of the antelope hunters in Campbell County were non-residents. (In the entire study area, 60 percent of the deer hunters and 50 percent of the antelope hunters were non-residents.) This 3:1 ratio in Campbell County will reverse itself at a rate proportional to the increase in the human population of the area. Some population estimates indicate nearly total resident hunters as early as 1985, based upon present big game populations. It is important that this change be presented, as many businesses and landowners in the area depend, in varying degrees, upon the income of non-resident hunters who pay for food, services and materials. Residents have been very reluctant to pay hunting fees to landowners and rapid,

rather significant, changes will have to take place in the attitudes of land-owners and hunters if sufficient harvests are to be obtained.

Response: Page I-347 supports the 1973 nonresident use in the basin and Volume II, pages I-537-541, discusses each of the above points. Pages I-347 and I-537 have been revised to reflect quantified nonresident deer percentage and to discuss management techniques.

40. Sierra Club, Northern Great Plains Office

All of the comments raised in this letter have been answered in the hearing portion or in previous letter responses.

41. VTN Mineral Development Corporation

Comment: The total amount of land required for the right-of-way is approximately 3,600 acres using maximum $1\frac{1}{2}$ to 1 cut slopes.

Response: The DES used an acreage figure of 2,400 acres. There is no apparent basis for the 3,600 acres supplied in this letter. The 2,400 acres in the DES include only the 113-mile mainline to be constructed and excludes any spur lines (i.e., Gillette to Carter and the A.R.Co., Kerr-McGee line). The 2,400 acre figure was derived from information contained in the document "Burlington Northern Inc. Environmental Analysis of the Railroad Line Construction and Operation between Douglas and Gillette, Wyoming." This document used a 2,600 acre figure for a 126-mile line. The line was relocated and reduced to a 113-mile line per engineering data submitted to the EIS team by Burlington Northern Inc. The required acreage for the 113-mile line was reduced in proportion to the reduction in length from the 126-mile line. The environmental impact analysis prepared for the line dated 4/30/74 by VTN did not identify the precise acreage involved in the right-of-way.

Comment: Depending upon the ultimate number of coal operations which will be developed adjacent to the proposed rail line, the additional spur trackage required to connect to the western alternative route will be in the magnitude of 40 to 70 miles. This figure could become even greater if improved technology made it feasible to develop other existing reserves.

It is stated that even though the spurs would be "slightly" longer, the shorter length of the main line for the western alternative would produce a net result about equal to that of the proposed route in terms of vegetative disturbance. This cannot be considered valid in light of the 40 to 70 miles of extra spur trackage required by the western route. The western alternative is only one mile shorter than the preferred route.

Response: The 40 to 70 miles seems to be an excessive, undocumented figure. Based on maps supplied by Burlington Northern, the average distance between the proposed route and the western alternate is 5 miles. Based on this 5-mile figure and the stated 40 to 70 miles of additional track, this would mean development from 8 to 14 miles in this stretch where the two routes diverge. Based on leaseholds and presently known plans, the most likely development is 4 to 5 miles.

The statement as quoted from the DES in the second paragraph of the comment is in error and the final EIS text has been revised.

Comment: Current engineering calculations now show that 35 million cubic yards of material will have to be removed to achieve 1 1/2:1 side slopes compared to 15 million yards on the preferred route.

Response: The DES stated that the western route would require movement of approximately 27.5 million cubic yards of material, as provided by the engineering department of the Burlington Northern Railroad during the month of

April 1974. The environmental analysis on the railroad dated 4/30/74 did not identify what would be required in the way of earth movement for any of the proposed routes. The new figure of 35 million cubic yards is only 1/4 more than the amount on which the impacts in the DES were analyzed and appears to not significantly affect the impacts as analyzed in the EIS.

Comment: The increased spur trackage necessitated by the more remote location of the western route would cross additional coal reserves. Exploitation of these mineable reserves would require the ultimate relocation of large reaches of spur line.

Response: The increased spur trackage does not appear to be that much greater. The impact on coal was recognized in the DES which stated on page II-174, "These spurs would cross additional economically mineable coal but could be moved to allow for coal mining."

Comment: Since the western alternative requires an additional 20 million cubic yards of cut and fill work compared to the preferred route, the water quality impacts will be significantly greater. The increased construction effort will disturb more land which will then be subject to erosion. Erosion from the larger borrow areas and the more numerous cut and fill slopes will increase the suspended solids loading to all streams downstream from the construction activity.

Response: The impacts of the western route were analyzed based on an amount of cut and fill material only 1/4 less than the revised figure quoted in this letter. It was the conclusion of the DES that the impact on water quality is more related to location of the disturbance on the drainage system than the amount of disturbance. The further upstream on the drainage pattern, the less the disturbance because of less volume of water expected to occur within the drainage.

Comment: The negative aesthetic impact of the excessive cut and fill requirements of the western route would be significantly greater than the preferred route.

Response: This fact was accounted for in the impact analysis.

Comment: Reference is made within this section of the EIS to the concept that the western route would probably cause the least environmental disruption during construction because it is adjacent to Highway 59 along most of the route. It should be noted that the preferred route closely parallels an existing unimproved county road. This county road would provide access to the construction sites without interfering with the heavy traffic experienced on Highway 59.

Response: In order to handle the construction equipment and movement of material and workers the county road would probably have to be improved, causing additional impacts. Heavy traffic is not currently experienced on Highway 59, re the DES p. I-381 "Traffic over State Highway 59 between Douglas and Reno Junction is presently a very light 380 to 400 vehicles per day as compared with 1,120 per day from Gillette to Reno Junction." The heavy traffic predicted for this area will not occur until after the projected railroad construction period.

Comment: Recreational potential of the Eastern Powder River Basin was described as "minimal" or "low" on page II-111. Hunting is the primary activity which is available to the residents in the area. We feel that hunting will not be impaired by the positioning of the railroad along the preferred route since access can be obtained to any sector of the area through the existing system of oil field roads, county roads, and private roads.

Response: If access is allowed within the railroad right-of-way, no rights-of-way fenced; if fenced, there are gates at one-mile intervals and

at all truck trails then the impact of the railroad will be "low." However, this is not likely to occur.

Upon further examination of public use, Wyoming Game and Fish data and familiarity with the basin, the statement's description of "low" recreation potential is too conservative and requires modification. Reference will be made in the FES to the area's popularity for hunting antelope.

Comment: Figure 1, "Analysis of Railroad Impacts Matrix," should be modified as shown.

Ranking of recreation impacts for the proposed route as medium disagrees with earlier descriptions of recreation use as "minimal" or "low." In addition, recreational impact for the western route is ranked "negligible" yet a diversion of this route to bypass the upper reaches of the Antelope Creek - Dry Fork drainages is described on page II-75 as minimizing impacts on recreational use.

Response: The use of the terms "minimal" or "low" describes the base line condition. The impact matrix describes the analyzed impact of the project on the base line conditions. The reference attributed to page II-75 cannot be found in the text.

Comment: (Pages II-104, p. 5; II-33 and II-34 - Discussion of Revegetation and Erosion Control - "Reclamation, if successful, will produce a grass cover...." "Revegetation of those portions of the rail line right-of-way not used for the actual track structure will be completed following construction, whenever possible". Based upon the rapid revegetation of the 1 1/2:1 cut slopes adjacent to Interstate Highways 25 and 90, there is little doubt that the majority of the railroad cuts and fills can be successfully rehabilitated with native grasses. Within two growing seasons the Wyoming Highway Department has been able to revegetate virtually 100 percent of all cut and fill slopes with

a mixture of native grasses. The Burlington Northern railroad has been able to accomplish the same results on the existing Gillette to Amax spur. In those instances where cuts are made through solid sandstone beds, it will not be possible to establish vegetative growth. While this same problem is encountered in road cuts adjacent to the newly constructed interstate highways, the resulting exposed bedrock cuts are not unpleasant to the eye.

Response: Aesthetically, successful reclamation will reduce the linear intrusion across the rolling, open grasslands. However, the aboved mentioned statements are correct.

Comment: The effectiveness of fencing would depend in part on the design used. Both antelope and deer will jump conventional and "sheep-tight" fences, and antelope will pass under conventional fences if the bottom strand of wire is removed (20-inch clearance). Cattle underpasses would be effective in most cases if properly constructed. Any reference to the railroad acting as a barrier to wildlife movement is refuted by experience. Antelope and other quatrapeds become adapted to the railroad and do not appear to be restricted by railroad right-of-way fences. Antelope have been seen jumping railroad right-of-way fencing on the existing Burlington Northern line, both east and west of Gillette. The same has been true on the rail line east and west of Douglas. Access to the area between Highway 59 and the preferred route by hunters should provide no difficulty since a railroad right-of-way has not restricted hunting activities in the past.

Response. Massive amounts of data regarding the "game-fence" relationship have been collected in Wyoming, particularly in relation to antelope. Antelope will on occasion jump a fence, but to depend on the ability of antelope to jump fences during normal movements would not be an acceptable management approach.

It is agreed that, except during heavy snow periods, a "20-inch bottom gap" would be more than adequate to allow antelope passage.

To date, observations of various underpass structures have indicated marginal value and effectiveness as big game passes.

In the final analysis, it still appears that railroad R/W fencing will very likely pose a severe barrier to deer and antelope movement.

Comment: Numerous references are made to wayside fires along the right-of-way which reportedly are caused by passing trains. These references were developed from fire statistics compiled by fire marshalls from Campbell and Converse Counties. It would be extremely difficult to determine what percentage of fires in the vicinity of the railroad were related to highway traffic or were caused by lightning. The number of claims against the railroads for wayside fires does not come close to the number of fires attributed to the railroads by the county fire marshalls.

Response: Table 8, page II-42 in the DES provides the source for the number of fires as the Wyoming State Forestry Division. The DES provided a wide range (10 to 50) of probability for yearly fire occurrence. Information and comments received from the State of Wyoming and EPA indicate that the estimate of fire occurrence may be too low. Without definitive data, the range of 10 to 50 seems adequate to project impacts on.

Comment: While theoretically 300 or more cars could be moved in one train under optimum conditions, a loaded unit coal train operating in the Powder River Basin could never be expected to move much more than 110 railcars.

The proposed rail line will be single track. The railroads do not expect to convert to double track along the Gillette to Douglas route in the foreseeable future. With a centralized traffic control system plus the necessary

sidings, train capacities of over 70 per day have been achieved without serious delay.

Response: It is agreed that the 300 or more car train is theoretical. The capacity of 70 trains a day may be possible. However, more sidings and/or greater train speeds would be required (which may not be possible) to achieve this capacity. The theoretical capacity was based on predicted train speeds, number required and was developed by a Chicago and North Western engineer.

Comment: (Page II-102, paragraph 1) "The cuts will destroy any archeological or paleontological values in the area." These impacts can be avoided by archeological and paleontological surveys prior to construction to identify potential sites and salvage operations where warranted. Rather than destroying these values this procedure frequently allows for salvage of artifacts and sites that otherwise would not be discovered. A detailed archeological survey of the proposed route is currently being conducted by a field crew under the direction of Dr. Frison from the University of Wyoming.

This philosophy is in line with the recommendations set forth on page II-136 of the Draft EIS concerning the establishment of a resident basin paleo-archeologist under the supervision of the State Historic Preservation Officer to supervise all survey and salvage work.

Response: Dr. Frison's extensive surveys are the initial steps being taken that would conform to the procedures described on analyses potential impacts prior to mitigative action.

Comment: Page II-27, Table 2 "Highway 59, Sec. 28, T35N, R70W Railroad Crossing". This line should be revised to read "Highway 59, Sec. 28, T35N, R70W - Railroad Overcrossing."

Response: The preliminary report of environmental analysis prepared by BTN had this listed as overcrossing. The final report as issued by VTN (4/30/74) had it as an undercrossing.

42. Leland J. Turner

Comment: No mention is made of exploration drilling the impact of surface damage from drill hole tailings or the damage to underground water sands that are repeatedly pierced by drill holes.

Oil seismograph, uranium and coal exploration all have covered this area. On our ranch we have been drilled across by all three explorations. The deepest holes have been 1,500 feet to 2,000 feet deep, with the average at something around 250 feet. In some areas, holes are drilled to this depth on 100 ft. centers. The sterile soil is brought to the surface and covers the topsoil for an area of maybe a rod square.

The drill hole itself is "plugged" only at the surface and I have seen drill holes flowing water that were plugged with a post driven into the drill hole.

Response: Exploration drilling for coal on federal coal leases is governed by the Coal Operating Regulations 43 CFR 211 and supervised by the U.S. Geological Survey and the surface management agency. These regulations require bonding, adequate plugging of drill holes, and reclamation of the surface. Oil seismograph holes drilled on federal oil and gas leases are also within the area of supervision of the U.S. Geological Survey. On Forest Service lands a special use permit and bond are required prior to any exploration work. Enforcement of permit and lease stipulations and the operating regulations prevents the occurrence of the impacts mentioned in this comment.

There is no federal control or supervision of exploration drilling for uranium on claims or oil seismograph holes on private lands. Any plugging and reclamation work is at the discretion of the private surface owner.

43. Nebraska Public Power District

No response required.

44. Bruce J. Terris, Attorney for the Sierra Club

Several of the comments raised in this letter have been answered under the hearing response section.

Comment: First, the draft EIS does not adequately discuss the serious deficiencies in the quality of the coal reserves that would be extracted from the Basin. Those reserves consist of subbituminous coal and lignite which are capable of producing only relatively low amounts of heat (expressed in Btu's per pound) by comparison with the high Btu value of low-sulfur bituminous coal that can be extracted from other U.S. sources chiefly in central Appalachia.

Response: We normally do not judge the coal mined in any region or area to be deficient with respect to other coal elsewhere. The reserves of the basin are capable of producing as much heat as low-sulfur bituminous coal that can be extracted chiefly in central Appalachia. A comparison of basin coal and Appalachian coal, with respect to Btu per pound is made in the section of this report entitled Alternate Sources of Energy, Alternatives to the Proposed Action in Chapter VIII of Part I. Additional discussion of heat content can be found in the response to hearing testimony.

Comment: Second, the draft EIS does not adequately discuss the cost of coal from western strip mines when delivered to the Middle West and East. Study has indicated that this coal is substantially higher in price than mid-western and eastern coal on the basis of cost. The BTU. Id., p. 18.

Response: In those instances where the price of coal at the utility or other consumer is the only consideration, cheaper coal will displace the more expensive coal in the market place. In many instances coal suppliers are

competitive, thus assuring a commitment of coal reserves sufficient to fuel an installation for its expected life. Where cheaper coal is displaced from the market place, considerations other than price are indicated. Some of these considerations could be unacceptable sulfur content, unavailability of reserves in sufficient quantity, or excessively high ash content.

Comment: Third, the draft EIS does not adequately consider the availability of large amounts of low-sulfur coal in the East, particularly when the sulfur content is analyzed in relation to the Btu value of the coal. Studies have shown that "low sulfur coal in the Central Appalachian States has four times the energy potential of the reported strippable coal in the Northern Great Plains and New Mexico." Environmental Policy Center, Facts about Coal in the United States, (April 1974), p. 9. Furthermore, this low-sulfur Appalachian coal represents a large percentage of the available low-sulfur coal in the United States and the heat content or Btu value of Eastern coal has been calculated at 55% of the total U.S. coal reserves. Id. at p. 1.

Response: Low-sulfur coal by definition is coal containing less than one percent sulfur by weight. Eastern bituminous coal yields about 12,000 Btu per pound and therefore cannot contain more than about 0.7 percent sulfur and satisfy environmental regulations with respect to fuel. Thus, much of the low-sulfur eastern coal is in fact not available for use as fuel in conventional plants. The fact that much of the eastern coal must be recovered by underground mining methods and that most coal occurs in relatively thin coalbeds is indicated in section entitled Coal (Nationwide). The text has been changed to indicate that not all low-sulfur eastern coal is environmentally acceptable.

Comment: Fourth, the draft EIS does not discuss why utilities are seeking to use the western coal, including the reserves in the Powder River Basin, despite its low quality, higher costs and the availability of eastern low-sulfur

coal. It appears that the reasons for this shift include the ease of obtaining large blocks of coal reserves by leasing coal lands from the federal government and Indian tribes, the desire to avoid contracts with union coal miners, the less stringent reclamation laws and lower royalty payments for coal extracted from Indian lands, and the "fuel adjustment clause" in electric-rate structures which enable the utilities to pass through to customers all of their increased costs for western coal at a substantial profit and without rate-increase hearings before state utility commissions. Id., pp. 14-15.

Response: For whatever the particular reason, the fact nevertheless remains that certain utilities have determined that it would be within their best interests to enter into contracts for the purchase of Powder River Basin Coal. Whether these decisions are environmentally justified remains to be seen and these essentially private business decisions are not directly within the purview of the National Environmental Policy Act of 1969. This statement addresses the environmental impacts associated with coal development in the study area and reasonable alternatives. The reasons behind utility purchase of this coal resource is clearly an extremely complex subject and is not within the scope of the DES.

Comment: Sixth, there is no consideration of the effect on Appalachia and other economically depressed coal areas in the Midwest and East from the huge expansion of coal production in the West. Western coal development could result in additional unemployment in the Midwest and East or prevent, at the least, an increase in employment in areas of present high unemployment. Similarly, there is no consideration of the effect western coal development will have on eastern railroads which are already financially depressed.

Response The impacts of coal development in the Eastern Powder River Coal Basin on the economically depressed coal areas of the Midwest and East and eastern railroads is too speculative to be subject to a meaningful analysis. Based upon the projected coal production as shown in Figure 3 it can be concluded that there will be a large market for Midwest and Eastern coal. Production from the Eastern Powder River Coal Basin will be able to satisfy only a portion of the increased coal demand. Thus production from the Eastern

Powder River Coal Basin should not displace production from existing mines in the Midwest or East and should not prevent the development of new mines in those areas. The alternative on Coal (Nationwide) has been revised in the FES.

Comment: Seventh, at a time when the United States is particularly concerned with attaining energy self-sufficiency and with reducing energy waste, the draft EIS does not consider serious losses of energy from the use of the large quantities of diesel fuel by the unit trains that will transport coal from the Powder River Basin to consumption points half way across the country. Fair analysis requires the deduction of the energy consumed in this transportation from the energy produced by the coal which is transported to obtain the net energy produced. Again, there are serious environmental and economic questions to the option of expanding utilization of coal reserves located closer to energy users in the East.

Response: The amount of energy necessary to transport coal from the Eastern Powder River Basin is compared for net energy efficiency at destination for a typical unit train from Orin Junction to St. Louis, Missouri. From this information calculations can be made for other situations and destinations.

Basic data and assumptions:

Track mileage (Orin Junction to St. Louis, Mo.)	1,011 miles
Average train speed	40 MPH
Total time of trip one-way	25.3 Hr.
Fuel consumption 3,000 HP Locomotive (Full-Load)	152 Gal/hr.
Fuel consumption 3,000 HP Locomotive (empty)	38 Gal/hr.
Btu's/Gallon-Diesel Fuel	138,690 Btu's
Btu's/Ton-Coal	172(10 ⁵) Btu's
Unit train - 110 cars, five locomotives train capacity	11,000 Tons

Energy Transported:

$$11,000 \text{ tons} \times 172(10^5) \text{ Btu's} = 1,892(10^8) \text{ Btu's}$$

Energy Consumed:

$$\text{Full Load Trip: } 25.3 \text{ Hrs} \times 152 \text{ Gal} \times 5 \text{ Locomotives} = 19,228 \text{ Gallons}$$

$$\text{Return Trip Empty: } 25.3 \text{ Hrs} \times 38 \text{ Gal} \times 5 \text{ Locomotives} = \underline{4,807 \text{ Gallons}}$$

$$\text{Total Fuel Consumed} \qquad \qquad \qquad 24,035 \text{ Gallons}$$

Total Energy Consumed:

$$24,035 \text{ Gallons} \times 138,690 \text{ Btu's} = 33.3(10^8) \text{ Btu's}$$

Efficiency - 2% of the energy transported would be required for transportation.

Comment: Eighth, the draft EIS does not consider the environmental injury which will or may be caused outside of the Powder River Basin by the transportation of western coal to the Midwest and East. For example, additional air pollution will be emitted throughout the railroad haul; new transportation facilities may be needed in other areas such as facilities for transfer of the coal to water carriers; and dredging or other activities may be required in navigable rivers. In short, it is essential that the total environmental impact of the proposed federal action be considered.

Response: Pg. I-460 has been revised to indicate that impacts will occur in those areas.

Comment: Tenth. There is no critical analysis of the reclamation plans of the mining companies or railroads. Such an analysis requires an evaluation, based on past experience and scientific experiment, as to the likelihood that particular reclamation proposals will be successful at the particular site involved. While the draft EIS is honest in admitting in general terms doubt that reclamation can be successful, analysis of the particular soil, weather conditions, and reclamation proposals is also essential.

Response: The type of analyses referred to will be based on the type of information, timing, and processes required in the mitigating measures section of the site specific analysis (e.g., p. III-125).

45. Federal Power Commission

No response required.

46. The Institute of Ecology

Several of the comments (i.e., trace elements, 50% productivity, 14,000 acres disturbed) in this letter have been previously answered in the hearing comments or previous letters.

Comment: The importance of the extremes in precipitation is not properly emphasized. For example, the mean annual precipitation is about 12", but this is because there are a few extremely wet years. The precipitation distribution is skewed such that about 1/2 of the years receive less than 10" of total precipitation. At the opposite end of the spectrum, but equally important, is that most of the precipitation occurs from either a few heavy winter blizzards and/or a few severe thunderstorms. The hazards associated with blizzards are blowing snow, rapid drops in temperature and extreme cold. The hazards associated with severe thunderstorms are lightning, hail, flash floods and

hurricane force winds. These hazards are magnified in impacted areas in which temporary structures predominate.

Response: Most of the severe and extreme weather features are described to some extent within the climate sections. The statement tried to emphasize the data needed for analysis of its impacts on other resources.

Comment: In Volume II (I-461) there is included a section on Probable Cumulative Regional Impacts on Air Quality. This section deals almost entirely with stack emissions produced by coal burning electric generating plants. While amounts of particulate matter as well as amounts of sulfur dioxide and nitrogen oxides for different power plants, are noted (page I-647), no reference is made to specific effects of these emissions on agricultural flora.

Response: Lack of data for specific plant siting and for estimated ground level concentrations of air pollutants within the study area, precluded an analysis of specific effects to crops and vegetation. Only general information on such effects was available and this was included on pages I-467 and I-468.

Comment: The soils data is misleading and inadequate. The area soil association map (Map 7, Appendix) is too vague and generalized to give any more than a very cursory overview of the study area. A more detailed and comprehensive map is needed for planning and assessment.

Response: The fine detail could not be obtained at the regional level due to the large area that was analyzed. More detailed maps needed for planning are included in the site specific analysis of the statement, Parts II-VI.

Comment: The study area is reported to contain 4,978,560 acres (p. I-16). The total acreage of the 21 area soil associations contains only 4,668,780 acres. This is a difference in excess of six percent of the total. It is not clear whether the missing six percent are included in lands listed as "miscellaneous

areas" unable to be classified. If so, Map 7 shows no gaps for the unclassified areas.

Response: The computed total acreage for the 21 soil associations was in error. The total has been revised in the FES.

Comment: One should have percentages of vegetative cover and kinds of vegetative covers as a function of soil unit, soil mineralogy, and soil depth and texture. These should be superimposed on a landform map showing soils actively forming, accumulating, or eroding so that past and future impacts can be assessed. The work is easy to do and could have occupied 3 man-months at the mine sites to get adequate information.

Response: All of the above assessments can be made by using the Regional and site specific information for soils and vegetation, (tables, maps, descriptions and figures in the text).

Comment: Predicting such results assumes that the best technology will be applied, including the addition of topsoil and selective sorting of spoils to avoid placement of clays and toxic substances on or near the surface. Nowhere, however, is such a handling procedure specified in the EIS. There is nothing about selective sorting; on the contrary, large earthmoving equipment is to be used on the 5-60" soil layers indiscriminantly for collection of the soil.

Response: As stated in the topsoil removal section of Chapter 3, Part I, topsoil will be removed from surfaces to be disturbed using scrapers. Scrapers were chosen because they can remove the topsoil in very thin layers. This is beneficial since much of the topsoil in the study area is less than one foot in thickness. Soil analyses will be conducted so that any concentrations of toxic materials can be identified. This material will then be selectively

removed and disposed of within the spoil area with scrapers or other suitable equipment.

Comment: (Volume II, pages I-505-I-507) . . .Such plant succession is evident in the work of Lee Lang quoted in the EIS (I-505-507). Even this work was selectively misquoted in that his 1940's thesis states that 50 years would see recovery but his 1973 work showed that to be quite wrong.

Response: Lang's 1965 work, reported in 1973, did show a severe deterioration of the vegetation over the 22-year period after his 1940's work. However, he attributed this deterioration to severe overgrazing on this particular tract of abandoned farmland. Native shortgrass-sagebrush rangeland adjacent to this abandoned farmland apparently deteriorated slightly under grazing but not enough to indicate a change in condition class. Lang's work in 1965 does not necessarily indicate that recovery could not take place in 50 years, but it does indicate that grazing intensity could be a major factor in determining time required for recovery.

Comment: There is no basis for the idea of 4,036 acres of "rehabilitated" land in the 5 years from 1980 to 1985. Lang's charts do not support it, and it is the only data presented. Ninety-two percent of the acreage to be disturbed is dominated by sage (I-505) which could not be expected to recover to even 10% of its original cover after 5 years.

Response: This depends largely on what is considered rehabilitation. It is assumed within the document that the land will be rehabilitated for livestock grazing within five years, and comparing plant succession and natural revegetation with rehabilitation for grazing use is an invalid comparison. If "climax" vegetation is the ultimate objective of rehabilitation it would be true that five years would be totally insufficient. Reference is also made to the

responses in the hearing portion of this volume. It is assumed that the mined lands can be rehabilitated within five years to some form of grazing use but at a significantly lowered grazing capacity.

Comment: To be useful, the EIS should show graphically where excess surface and underground waters exist and where water will be needed for coal development. How water will be transported, and who and what is impacted in the process should be specified. Does this statement advocate transfer of water rights from agriculture to industry?

Response: Pages I-487 and I-489 show, by graphs and by a table, potential water supplies in the study area and in the entire Powder River Basin. The development of water supplies, whether from surface-water sources or ground-water sources, will be the responsibility of the energy companies and municipalities having need for additional water. The development of these water sources will be subject to the constraints of the Wyoming State Engineer and the Board of Control. The EIS does not advocate the transfer of water rights from Agriculture to industry; it makes no recommendations. It does state, however, that such transfer of water rights is a possibility.

Comment: On page I-54, the EIS makes a major error. There is not an infinitely large supply of ground water based on 150,000 acre feet per year. In fact, there is no basis for this figure. The latest Wyoming Water Plan shows considerably less and without further information, it is not possible to say how much can be withdrawn under the "safe yield" concept.

Response: Wyoming Water Plan Report No. 10 for Northeastern Wyoming (April 1972) states on page 85 "By estimate, 85,000,000 acre-feet of ground water in the Wasatch-Fort Union rocks are the near-surface formations in much of the Powder River Basin. Deeper-lying formations in the basin are also

potential sources of ground water. On page 85 of the above mentioned report is a table showing recharge of more than 120,000 acre-feet per year to alluvial deposits in northeastern Wyoming. Alluvial deposits occur only along stream valleys and constitute a very small percentage indeed of the total aquifers present in the basin. The EIS statement that 150,000 acre-feet of ground water is available is believed to be a conservative estimate. The estimate was made in order to compare the availability of ground water to the estimated demand of 50,000 acre-feet per year by 1990 to develop the coal in the study area.

Comment: In the previous paragraph on I-54, the reference to increased irrigation in drought years should be clarified. The discussion on I-53, 54 is misleading. Oil field and deeper aquifers should be separated from shallow aquifer characteristics. The EIS gives the impression that there is a surplus of shallow ground water (I-257). This just is not correct.

Response: In order to get a good stand of vegetation growth on reclaimed land, it will probably be necessary in dry years to increase irrigation of these reclaimed lands.

No discussion of oil field and deeper aquifers or of shallow aquifer characteristics was found on pages I-53 and 54. On pages I-195 to 217, the discussion of ground water occurrence is discussed separately under "Upper aquifers" and "Deeper aquifers". Recharge, movement, and discharge relations are also discussed separately on pages I-217 to I-229 under "Alluvium", "Tertiary and Upper Cretaceous Rocks", and "Deep Aquifers".

An impression of surplus water is not implied on page I-257. What is shown is that a considerable amount is in storage in the near surface deposits. The impacts on developing these supplies are discussed in Volume II, Chapter V.

Comment: Page I-195, paragraph two, is misleading. The deeper formations hardly outcrop nearby. They outcrop more than fifty miles away.

Response: This is correct - some of these deeper formations do outcrop more than 50 miles away. Deep water wells, however, have been developed in the Madison Limestone on both sides of the Powder River Basin that are as much as 40 miles from the outcrop of the Madison. Drilling to determine the occurrence of suitable sources and the feasibility of developing the water from the deeper rocks is now underway in at least three different parts of the basin at this time (1973 & 1974).

Comment: On page I-232 it is stated the drainage pattern is dendritic. However, the drainage pattern is distinctly parallel and control is not random.

Response: Smaller tributary drainages are not parallel, rather they show lack of direction, orientation or control. The classification as dendritic is based on the overall basin configuration.

Comment: It is unclear on page I-255, last sentence, if the largest use is by volume, by number, or beneficial use. Is the implication correct that water is not good for much of anything?

Response: The largest use is by volume of ground water injected for waterflood in the secondary recovery of oil. Much of the water would be suitable for most domestic, stock, municipal, or industrial use. Probably very little of the water would be suitable for irrigation use.

Comment: Absent from the EIS is a discussion of water quality and quantity changes which will occur with the mining of aquifers. Aside from impacting a few nearby wells, the statement does not discuss alkali lakes which will form in mine cuts and the leaching of trace elements.

Response: Water quality and quantity changes which can be expected from mining operations are discussed on pages I-492 to I-496 and I-499 to I-501.

These discussions lack specific detail because data is not available at present to properly evaluate the impacts that will occur. Logical conclusions have been drawn from the data available. As more data becomes available from mining operations and from the associated monitoring programs, reassessments of the impacts will be made by those agencies having control of water use and pollution or contamination of water supplies or water sources.

Comment: The statement does not recognize or make use of recent research on the Decker Mine in Montana which documents seepage of surface and near surface waters into mine pits and the associated water degradation. This problem needs recognition in the Powder River Basin.

Response: Recent (summer 1974) test drilling and water sampling in the vicinity of coal mining operations near Gillette, Wyoming, in conjunction with the Northern Great Plains Resource Program have disclosed that ground water conditions in the coal near Gillette differ considerably from ground water in the coal near the Decker Mine in Montana.

Comment: In the report, the fifty percent figure seems to be used in different ways. For example, on page I-59, there is the statement, "There will be a fifty percent loss in productivity for grazing purposes," and on page I-513, "The total vegetative cover will be greatly reduced, probably near fifty percent of that found on adjacent undisturbed range." And on page I-861, there is the statement, "long-term productivity of this land will be lowered by fifty percent, or 2,600 animal unit months per year." None of these statements are using the word productivity correctly, from an ecological perspective.

Response: The statement on page I-59 and on page I-861 ties to the assumption that there will be a fifty percent loss in productivity for grazing purposes. This relates only to grazing productivity and is not a measure of

productivity from an ecological perspective. The 50% loss of grazing productivity is carried throughout the document as this is one of the basic assumptions. The relationship noted between cover and productivity is entirely incidental in this case.

Comment: Further, there is no data on current productivity of each vegetation type and no data on species relative abundance. Such data are important for evaluating rehabilitation success, and also in planning for successful rehabilitation. These data are not provided in volumes III or IV as well. Though rare and endangered species are considered under wildlife, no mention is made about rare and endangered plant species. Was this possibility considered? Will rare habitats be destroyed? There is no mention of this possibility.

Response: The productivity of the area varies from place to place depending on grazing pressure, soil type, vegetative composition, etc. The collection of this data is called for in the mitigating measures before reclamation is started.

There are no known rare and endangered plant species or habitats that will be affected by mining.

Comment: On pages I-268 and I-269, the statement that buffalo has a "profound effect" on vegetation is unclear. Also, the discussion on zootic climax and the role of big sagebrush is rather antiquated, in view of current thoughts about ecosystem structure and function.

Response: The DES indicates that buffalo "had" such an effect on vegetation. There are many current thoughts about ecosystem structure and function; the statement used the one considered the most appropriate for the study area.

Comment: The term "dry meadow grassland" is very inappropriate and confusing, especially considering the species composition which is typical of a mesic situation.

Response: The term "dry meadow" was used in the text to prevent confusion with other grassland types.

Comment: For example, in Table 10, page I-505, the comment is relevant to both the vegetation section and other sections also. The figures in this table are both appropriate and impressive, but a final decision on the importance of the impact cannot be made until the figures for each vegetation type are also expressed as a percentage of the total area occupied by each type in the Eastern Powder River Basin for which the EIS is prepared, and also as a percentage of the total area in the Basin. The same can be said for the data and discussion on page I-650, I-653, and I-688. The percentages are likely to be very small, e.g. on page I-662 where this was done essentially for loss of livestock forage. More of these calculations are needed and they can be done without much difficulty.

Response: It was not felt appropriate or necessary for impact analysis to use this type of percentage. The data is available for this type of calculation by those who wish to prepare additional analyses.

Comment: (Volume I, I-518 & I-525) Along this same line of thought, if populations of wildlife will be lowered, what will the percentage reduction be for the entire Eastern Powder River Basin? On page I-525, the statement is made, ". . . this habitat disturbance will most likely have a long term cumulative impact on fish and wildlife populations and could result in losses which cannot be presently quantified." How can one evaluate impact from such generalities?

Response: Refer to Volume I, pages I-518 and I-530-536. Percentage

reduction figures are presented for some major species. As is pointed out in the discussion, these losses are the ones that can be determined with any degree of accuracy. Undetermined losses of others will occur. The statement referred to on page I-525 is part of a section headed "Habitat losses" which attempts to describe how wildlife will be impacted because of habitat losses. On pages I-529 thru I-536, the section entitled "Specific group and species impacts" attempts to quantify and summarize the total impacts on specific groups and species to the extent that information was available and impacts could be quantified. Where this was not possible, it was acknowledged as such.

Comment: Choice of seed is taken far too lightly in the discussion of rehabilitation. There is no reason to restrict choice of seed to cool season species (I-633).

Response: Agreed that there are other grasses than cool season species that can be used in the area. The text has been revised to reflect this.

Comment: (Volume I, pp I-323 - I-326) Big Game. Information on big game is more complete than any other section under wildlife but two important items of information are lacking: (1) for deer and antelope population figures are presented only for the winter 73-74 (Table 28, I-323). Since ungulate populations can fluctuate significantly in density from year to year, population estimates should be presented for several years prior to development, and (2) no information is presented on elk migration routes.

Response: Wyoming Game and Fish Department field Big Game Biologists were consulted concerning big game population figures. They provided the population estimates for the winter of 73-74 and felt that these were figures representative of the populations they are currently managing for. Significant fluctuations in populations will be met with adjustments in harvest. While

additional winter population estimates may be desirable, they could be expected to reflect, primarily, the results of management efforts.

Elk populations in the study area are considered by the Wyoming Game and Fish Department to be, essentially, non-migratory.

Comment: There are no references to the "various technical reports" (I-339) used in part as the basis for the descriptions of drainages in general and of the "selected individual habitats," or as the basis of "List of Known and Probable Fish Species Found in the Study Area," (Table 32, Appendix C). Also, there is no methodological information. Hence one is unable to assess the little data which are included.

Response: Text and Table 32 have been revised in the FES. The intent of the DES was to provide an estimate of "what is at stake" should proposed coal development be authorized. Available data must be used even though scant in certain areas.

Comment: (e.g., smallmouth bass is listed as occurring in Keyhole Reservoir, but is not included in the "List of Known and Probable Fish Species Found in the Study Area" (Table 32, Appendix C); 14 of the 37 species of fish listed in Table 32, Appendix C, are not mentioned anywhere in the discussion; a nonexistent fish (the flathead minnow) is mentioned on page I-342; the flathead catfish, Pylodictus olivaris is not officially known to occur in Wyoming, and if it does occur, it is rare; northern pike is not listed in Table 32, Appendix C; the goldeye is mentioned on page I-346 as being on the U.S. Department of the Interior's "rare and endangered list for Wyoming, but it is not indicated as "rare" in Table 32, Appendix C.)

Response: Omissions from Table 32 and typographical errors (i.e., "flathead minnow") in the text have been corrected. The goldeye is listed

on pp. I-345-346 as being listed on the Wyoming Game and Fish Department "rare and endangered" species list. No mention can be found in the statement that the goldeye is on the USDI "rare and endangered" list.

Comment: For the little data that were presented, important specifics were omitted such as time of sampling, specific sampling sites and sampling methodology. These omissions make it impossible to evaluate the figures presented in the text.

Response: Sources of information used in preparation of the description of the existing environment and information used in support of impact analysis is referenced in the document in most instances. This information can be obtained directly from the source documents or individuals consulted. Cited source documents not commonly available can be reviewed at the office of the State Director, U. S. Bureau of Land Management, Cheyenne, Wyoming.

Comment: (Volume II, p. I-530) Big Game. Reasonable estimates are made on the reduction of the size of big game herds because of the loss of habitat. Some statements, however, are guesswork. For example, ". . . 50 percent of the total area disturbed by 1990 will be lost as deer habitat." There is simply no data available to support such a statement.

Response: Research evidence establishes that browse is the major winter feed for deer in Wyoming and generally limits populations. There appears to be no evidence to suggest that the browse on key deer ranges will be reestablished on disturbed land, or land covered by development facilities by 1990. By calculation of acreages and location of lease holdings and proposed plant sites on maps of the mine and plant developments probable by 1990 (Map 6, Volume V) and calculating acreages of deer range involved, it can be seen that approximately 50 percent of the disturbed or lost area is deer habitat.

Comment: There is no discussion of the possible effects of stack emissions on aquatic environments. In some cases they have profoundly affected the chemistry and biology of lakes, eliminating certain fisheries.

Response: No substantiated information concerning this subject was found by the EIS team.

Comment: Volume II, pages I-659 & 660) Probable Effects Which Cannot Be Avoided - 1) Wildlife

There are no estimates of:

- Number of threatened species which will be lost;
- Loss of upland game birds other than sage grouse;
- Loss of predators, furbearers, small mammals, song birds, and shore birds;
- Loss of important above ground invertebrates, such as pollinators;
- Loss of important soil organisms, such as saprophytic nematodes and arthropods, and mycorrhizal fungi.

Response: As indicated in the DES text, sufficient information upon which to quantify estimates of unavoidable losses was lacking. To attempt to quantify losses of such animals or above-ground invertebrates and soil organisms on the basis of existing information was felt to be unsound.

Comment: The concept and use of photo-interpretation of the aesthetics of the Powder River Basin is well done. There are good descriptions of major features of interest in the region (page I-312). However, the report should mention the Thunder Basin National Grasslands as an important aesthetic feature.

Response: The description section in Volume I for vegetation and aesthetics has been revised in the FES to discuss the grasslands and show pictures of the typical vegetative types.

Comment: The picture on page I-318 is inaccurate. The rock formation pictured is Camel Rock located on the Wyoming-Colorado border south of Laramie.

Response: The photograph is representative of similar buttes in the basin.

Comment: Recreation Resources. This section has a few inaccuracies which should be clarified or corrected. The map on page I-350 shows two state recreation regions but does not delineate their boundaries.

Response: It was decided that reference to the Montana, South Dakota and Wyoming State Comprehensive Outdoor Recreation Plans for regional boundaries and more detailed information would be more useful for in depth analysis. The scale of the map and need for easy reference required elimination of these boundaries.

Comment: Water Base Recreation. The Tongue River should also be included (I-359) as being under consideration as a possible addition to the National Wild and Scenic Rivers System.

Response: The FES has been revised to indicate this.

Comment: Winter Recreation. The Laramie Mountains should be added to the Big Horns and Black Hills as an area which offers opportunities for cross-country skiing (I-360).

Response: Page I-360 has been revised.

Comment: Primitive Lands. On page I-362, the Cloud Peak Primitive Area is listed incorrectly as containing 94,000 acres. The Primitive Area in fact includes 137,000 acres. It would be useful to further qualify the present status of this area. In November 1973, in compliance with the Wilderness Act of 1964, the U.S. Forest Service proposed 150,490 acres to be reclassified

as the Cloud Peak Wilderness Area. Considerable support for the "citizen-conservationist" proposal of 282,000 acres was voiced at the same time. Congress will ultimately determine the final acreage of the Cloud Peak Wilderness Area.

Response: The acreage used in DES was from only one county. The text has been revised.

Comment: The remainder of this section is incomplete. Only one area is mentioned as having potential as a Primitive Area -- the North Fork Powder River including an area of 16,211 acres. Indeed, there are many more potential Primitive and Wilderness areas in this region.

Response: Concur with all statements requesting potential wilderness (Laramie Peak) and the roadless areas (Bighorn National Forest). These have been added to the list. However, the characteristics of the Middle Fork of the Powder River and Fortification Creek have already been determined unfeasible for primitive management.

Comment: However, some references are unclear and recreational use figures are misleading. For example, what are the sources for the Projection Tables 12 and 13 (I-538, I-540)? What are the criteria for defining activities? The activity categories in Table 31 are too general. Furthermore, the percentage increases in recreational uses seem rather low. Particularly, "backcountry" recreation demands are in fact far higher than the other demands and should be analyzed as such.

Response: The chart (Table 12) is compiled by applying 23 percent of the population hunting big game (Wyoming Statewide Comprehensive Outdoor Recreation Plan) to the projected population growth--assuming a comparable harvest plan during these periods.

The above plan was used as a guide to the percent of past use of these activities in Wyoming. The activities were chosen as a sample of the principal recreation activities expected in the basin (not intended to be all inclusive) that would best represent the use growth resulting from increased population.

The Table 31 reference appears to be a typographical error as activities are not the subject of Table 31; however, Table 13 does discuss activities and the purpose of that list is explained above.

The percent increase is directly related to population increases defined for the statement and the State of Wyoming's recordation of past use in these activities.

"Backcountry" recreation demands have only been referenced under current visitor use of the Cloud Peak Primitive Area with no specific reference in Table 13. Hiking, camping, etc., listed in Table 13, have no inference to "backcountry" use.

Comment: A portion of the last paragraph dealing with water shortage, on page I-379 is missing.

Response: The text has been revised.

Comment: On page I-371 the statement is made that "sheep numbers have been on the decline in recent years. Numbers recorded were 303,700 head of sheep in 1974 for the two county area." Yet in Table 36 on the previous page, the total number of sheep in the two county area as of January, 1972 was only 243,400.

Response: There was an error in the text, 1974 should read 1964. The text has been revised.

Comment: The statement is made on I-371 that "Sagebrush, by far the most common shrubby forage species, is utilized primarily by sheep." This statement is in error in that sagebrush is only utilized by sheep to any extent in the winter months. In fact, IBP Grassland Biome research has brought out the fact that wildlife are the primary utilizers of sagebrush. Additionally, according to IBP Reports, it is highly probable that in the Powder River Basin, snakeweed (Gutierrezia sarothrae) is as common as sagebrush since this is true in most rangeland habitats in southeast Wyoming and northeast Colorado. (IBP Reports)

Response: This section deals with agriculture and agricultural animals. The statement was intended to imply that sagebrush is utilized primarily by sheep as opposed to cattle and horses. Since livestock are primarily wintered on the open range within the study area, sagebrush forms an important part of the sheep's diet during this period. Comparing the Powder River Basin floristically with the shortgrass plains in southeastern Wyoming and northeastern Colorado has limited validity. Sagebrush in most places dominates the vegetative aspect and is a major component of the plant cover in the Powder River Basin. It is true that wildlife are the major users of sagebrush.

Comment: On page I-375 the statement is made that "Total dryland cropland has decreased over the years..." However, Table 40 (I-376) only provides averages for an 18-year period and does not provide support for this statement. It is further stated that "during the past two years, some of these lands have again been placed into crop production in response to recent changes of government farm programs and rises in grain prices." There is no support presented for this statement.

Response: Tables #40 and #41 were not designed to provide support for this statement and do not appear to contradict it. The statement on the

proliferation of newly broken ground and old fields being placed back into small grain production is based on field travel. The abandoned fields and homesteads that were once present can also be seen.

Comment: On page I-378 it is stated that "An average of 2,480 acres of cropland are annually irrigated in Campbell County compared to 65,073 acres devoted to dryland farming." Yet in Table 40 (I-376) the major irrigated crop average adds up to only just over 1,000 acres and the major non-irrigated crop average adds up to over 75,117 acres.

Discrepancies between figures in tables and figures in the text occur frequently throughout the sections on Agriculture. Such errors are so frequent the text cannot be accepted as reliable base of information.

Response: Reference is made to Table 35 (page I-370) and Table 40 (page I-376). Table 40 was developed primarily to determine average crop yields and production for the area and Table 35; the average statistics of ranches in Campbell and Converse County. The data depicted in Table 40 represents data averaged over an 18 year period, whereas Table 35 is a one time statistic which represents the present situation. Evidently more irrigated cropland is present now than in the past.

Acreages of cropland and other statistics vary from year to year, therefore, the statistics contained in Table 35 would probably be different than the present. In addition the information presented in these tables were taken from two different sources depicting two different types of information within the area.

Comment: The total permanent losses in acreages of forage and crops when taken from the sections on impact by individual companies only adds up to

225 acres. This figure is in contrast to the 9,500 acres of permanently lost acreage presented on page I-542, making one wonder from what source the figures for the effect of individual mining operations was derived.

Response: Reference is made to the assumption and analysis guidelines contained in Volume I, pages I-56 thru I-59. The site specific analysis contains only 4 mining plans which is apparently where the 225 acres were derived. The 9,500 acres represents the projected permanent loss of agriculture lands by 1990 due to construction of plants, residential areas, roads and railroads. The projected cumulative development for the year 1990 is 14 mines, 6 power plants, 2 gasification plants, 24 miles of new roads, 150 miles of new railroads, etc. The four mines contained in parts III, IV, V, and VI are only a small fraction of the projected development.

Comment: On page I-543 it is stated that "secondary impacts (on agriculture) associated with population increases due to construction, mining, and related developments will occur." However, no attempt is made to project what these losses might be in terms of lost Animal Unit Months (AUMs) or forage acreage. Considerable losses are occurring in Rock Springs where the population is living in inadequate housing on the rangeland surrounding the plants being constructed. On the same page, mention is made of what could happen to livestock production as a result of the construction of railroads and roads which alter established use patterns. However, none of this material is projected into actual figures for summary purposes. It is obvious, then, that the summary figures in Table 14 are somewhat less than accurate. An impact statement should project probable impacts in terms of comparable figures, not just opinions.

Response: The projected loss of animal unit months of forage contained in Table 14 is based on the cumulative disturbed and reclaimed acreages in

the study area based on projected development acreage requirement unit table located on page I-56 - I-59. This table contains lands projected to be removed from agriculture due to population expansion and other developments within the study area. Alteration of established use patterns does not necessarily mean that the livestock forage is lost, but that the ranching operation and the established pattern of use may be disrupted.

Comment: In Table 5 (I-53), estimated irrigation water requirements are listed as 10,000 acre-feet annually throughout the period 1974-1990. How can this be if on page I-547, it is stated that there is going to be a six percent loss of irrigated lands through water right conversion?

Response: The statement on page I-547 says: "Approximately six percent of the irrigation water would be needed to satisfy the projected industrial and municipal needs by 1990." This does not mean that irrigation requirements would diminish by six percent.

Comment: Agriculture in the area is dependent on water. A whole section (I-195) is devoted to water resources. However, the quality of underground water is not discussed nor is the possibility that it may contain elements toxic to existing agricultural production.

Response: The quality of underground water is discussed at various places from pages I-199 to I-217 in Volume I. Table 17 lists 191 chemical analyses of ground water. Impacts of coal development on water quality are discussed in Volume II.

The possibility that toxic trace elements could be concentrated in plants and be consumed by livestock and wildlife is discussed on page I-499. The

possibility of leaching of toxic trace elements is discussed in other parts of the EIS, for instance on pages IV-105 and VI-74.

Comment: It is stated on Page II-114 that "an estimated 550 acres outside the right-of-way will be permanent loss (85 AUMs) due to access road construction, population increase and fire guards." In the next sentence, it is stated that "the majority of this loss will be a temporary loss for the two-year construction period." Is it then a permanent or a temporary loss?

Response: The 85 AUMs referred to is a permanent loss. The majority of the loss being temporary for a two-year period refers to the 146 AUMs included in the total of 231 AUMs affected. The text has been revised for clarification.

Comment: Another example of confused figures are those presented on hay loss and AUMs. There are at least three different figures presented for annual hay loss due to loss of irrigation water for the period 1975-1990: 12,235, 50,986, and 67,200 tons. The highest figure is based on a loss of 13,200 acre feet through water right conversion to industry (I-547). However, the projected unavoidable losses of AUMs presented on page I-662 are based on the lowest figure of 12,235 tons (549 tons annually as found on Table 14, I-544).

Response: The statement does not contain the figures mentioned in this comment. Hay production is stated in tons throughout the document and livestock forage as animal unit months of grazing. Tons of hay were not converted to AUMs of livestock forage.

Comment: In the Regional Analysis, aside from a very brief discussion of land tenure, there is no comprehensive description of present land use patterns.

Response: To our knowledge there is no comprehensive informational source available which could provide the information to detail land use patterns in anything more than a cursory manner.

Comment: The statement suffers from hasty preparation as evidenced in two ways. There are numerous minor and not so minor errors in the data presented. For example, paragraph 4, I-407, Vol. I, states there are 3,937 year-round housing units in Campbell County. The next sentence states there are 6,982 year-round housing units in Gillette and 5,683 housing units in rural areas for a total of 12,665 housing units in Campbell County.

Response: This was an error in the transposition of data from Table 49 to the narrative, and has been corrected in the FES.

Comment: The section on population, Volume II, I-565 to I-569 is so disorganized that it is almost impossible to understand how the population projections were made. Only by reading I-1 and I-6 of Volume I can the reader learn which proposed actions were supposed to have been included in the projections. Close examination, however, reveals that either not all of the "supposed-to-be included" actions were included or the statement contains gross arithmetic errors in the calculations.

Response: All of the proposed actions on page I-56 were included in projecting population growth. The projection figures provided by the University of Wyoming, Water Resources Research Institute were based on the same model used for the NGPRP projections and appeared to contain no errors. Coal related employment is based on tonnage of coal mined not the number of mines.

Comment: To perform a close examination, the reader has to discover that the only listing of basic employment for each activity on which the population calculations are based is Map 6 in the Appendix. The listing is not referenced in the population section. The following table is a summary of the figures contained in Map 6. This should be included in Chapter I of Volume I of the EIS.

One of the major points of nonclarity in the above is how construction workers were treated in making the calculations. This second sentence groups the basic sector alone and construction and residentiary together. The third sentence groups basic and construction in comparison to total employment.

Response: Map 6 in the Appendix is referenced in Part I, Chapter VI, Employment, where it is most directly pertinent.

The amount of construction employment was derived as a function of the necessity to satisfy coal related construction demands and other construction demands. An explanation of this derivation would be more appropriately referred to publications of the Water Resources Research Institute, University of Wyoming, who developed the model and supplied this work group with the data. W.R.R.I. prepared Energy Resources Development in Wyoming's Powder River Basin: An Assessment of Potential Social and Economic Impacts for NGPRP which contains six pages of derivation of employment in the construction and other residentiary sectors.

Comment: If an employment multiplier of 2.8 were used to calculate total employment, and a population multiplier of 3.2 were applied to the figures in the above table, the new population in Campbell County would be 98,067 by 1980. Old plus new population would equal 110,664 in Campbell County by 1980.

Response: The use of a 3.2 population multiplier as proposed appears quite high. That number appears to be more like an average family size indicator and cannot be used to achieve total population from total employment unless only one person out of every family is employed, which is not a reasonable assumption. The highest population multiplier used by DEPAD and cited by the Institute of Ecology is 2.5. By making an unrealistic supposition about the construction employment market the total population result was substantially inflated. To further inflate this figure the same population multiplier (3.2)

was used on construction employment as permanent. The DEPAD study cited by the Institute utilized a lower population multiplier for construction (2.0) than it does for permanent (2.5). The 2.8 employment multiplier cited in the comment, and taken from the statement, was derived from relationships for combined regional (eight county) employment and that figure is not appropriate for application to any one county and most particularly Campbell County where boom growth occurs and service employment may lag. To clear up this misunderstanding the example cited in the FES should be for Campbell County rather than the region, and this change has been made.

Comment: Given the extent of mobile housing likely to occur, much more information on mobile homes should be included on existing construction standards in Wyoming, location of large mobile home parks and service problems of mobile home parks in Campbell County.

Response: Although sufficient information is not available, some additional material on mobile homes has been included in the FES.

Comment: The computation of hospital facility needs is strangely remiss. According to Table 62, Campbell County will need 45 to 50 new acute hospital beds by 1980. The county will need most of these new beds by 1978 which is when the population will peak in the county for the five year period. Therefore, the bed shortage for Campbell County will become serious within three years. To lump together estimates for all hospital facilities for the eight counties when most of the population will live in one county is a serious error.

Response: The reasoning behind the decision to project future facility needs in this manner is explained in Part I, Chapter V, Socio-Economic Conditions, Health and Social Services, Facilities (p. I-592).

Comment: Analysis of water and sewage problems for Campbell County is completely lacking but very necessary.

Response: This information is simply not available and won't be until an indepth inventory, analysis of adequacy, and assessment of water and sewer needs is performed by a tem of sanitary engineers.

47. Natural Resources Defense Council, Inc.

Many of the comments raised by this letter have been answered previously in this volume. This letter raised four major and general points which were summarized and will be responded to here.

Comment: (Poor choice of region)

Response: The area selected for the Regional Analysis contains within its boundaries a natural coal field and development area. This area also contains the heart of the direct impacts associated with development of this coal field. Several potential impacts were recognized as not being confined to within the study area boundaries, and were analyzed basinwide to the extent that these impacts would be created by coal development within the Eastern Powder River Coal Basin. It is true that other coal fields exist, each with its own plan of development. The Birney-Decker area of Montana, Lake DeSmet are of the western part of the Powder River Basin and extending to the lignite fields of North Dakota. Each of these areas, however, if developed will have a principal area of major local influence. Some of these influences and impacts will overlap to some extent from one area to another. To carry the reasoning that these overlap areas be included in one environmental assessment would result in the addition of areas infinitum until inclusion of the entire Northern Plains, United States and eventually the world would result, with the result that focus on smaller regions would be obscured. Assessments of

local impacts are bound to suffer some degree of neglect if the size of the study area was enlarged.

Comment: (Regional analysis did not cover all planned developments.)

Response: All the confirmed industrial proposals were included within the Impact Statement. Many rumored proposals, including those announced within the newspaper, failed to materialize as realistic and were entirely speculative in nature. There is some difficulty, in separating the real, speculative, and rumored proposals for development within a project of this nature. Many proposals do not have a firm base of acquired resources, or the necessary commitments to proceed with development. In many cases information is not totally available as to company intentions and therefore must be assumed. Both realistic and speculative proposals will continue to be brought forth, many of which will undoubtedly not proceed to actual development. The statement was designed to provide an analysis of the potential impacts from development of the coal resources in the area where projects or proposals are known.

The requirement that the anticipated environmental effects of a proposed action be described in an impact statement is subject to a rule of reason. A basic function of this EIS is to indicate the extent to which environmental effects are essentially unknown, as has been done consistently throughout this statement. A basic thrust of federal agency analysis is to predict the environmental effects of a proposed action before the action is taken and before those effects are fully known. Reasonable forecasting and speculation is thus implicit. Accordingly, it is generally recognized that statements must be written late enough in the decision process to contain meaningful information, but they must be written early enough so that whatever information is contained can practically serve as an input into the decision making process.

It is believed that this statement is appropriately timed to fulfill the above mentioned criteria. In the regional analysis, this statement attempts to project the range of coal resource development which can reasonably be expected

within the study area and then identified the pertinent areas of environmental impact. Should more or less development be proposed for the region, the presented range of associated impacts would not change. Rather, there would only be an adjustment in the degree of effect within previously identified areas of environmental concern. It should also be noted that much of the projected development is not anticipated until beyond the year 1980 (see Part I, Chapter I, Assumptions and Guidelines). If the timing and degree of developmental activity would be redefined at some future point so as to necessitate a reexamination of the statement, the EIS would nevertheless be valid as a convenient frame of reference, or base document, from which any reassessment could proceed.

Comment: (Lack of data prevents compliance with NEPA)

Response: Lack of data is a chronic problem inherent with most studies dealing with future projections and anticipated impacts. The development of complete data would become a never-ending process and desires for additional knowledge never satisfied. If a study of this nature is ever contemplated to be completed, it must therefore be developed with the existing available information at that time.

Comment: (Alternatives presented in a foregone conclusion manner that development cannot be delayed or controlled.)

Response: An impression may have been conveyed that the alternative energy sources cannot readily replace the coal expected to be mined within the study area. This was not the intent of the agencies involved in the preparation of the document. This may stem from the analysis of each alternative energy source as to its potential as a substitute energy source. Many of the alternatives have not been placed into actual effect, therefore the total contribution to the energy needs cannot be assured. However, such analysis is necessary to assess the viability of these alternatives.

Another consideration that may tend to convey this impression is the time frame within which various alternatives may become an actuality. The time element capability of the alternatives must also be analyzed and conclusions drawn when determining its viability.

The suggested alternative of restricting mine-mouth development is addressed in the draft and final statement under the headings Alternate Modes of Distribution and Alternate Utilization Methods. Inherent in these discussions is the option of prohibiting mine-mouth generation. A new alternative dealing with complete coal exproation has been added to the FES.

48. Pat Ford

The comments and issues brought forward by this letter have been answered in the hearing comment section or under previous letters.

49. Gulf States Utilities Company

No response required.

50. Gulf Mineral Resources Co.

The various comments raised by this letter have been answered previously in this volume (i.e., no mitigation considered in impact section and 50% loss in productivity, hearing section).

51. Sierra Club, Upper Snake River Group

The various comments contained in this letter have been answered previously in this volume (i.e. trace elements, hearing response section; measurement of coal, hearing response section).

52. Bureau of Sport Fisheries and Wildlife, Billings Area Office

No response required.

53. Peabody Coal Company

The majority of comments contained in this letter have been responded to previously either under the hearing section or under prior letters. One comment concerning water useage has not been responded to previously.

Comment: Independent study of Peabody shows expected water useage of 81,900 acre-feet of water each year after 1985. Of this amount, less than 8 percent will be required for proposed projects. This contradicts findings presented in the statement.

Response: It is not clear as to what the independent study was or to what the 81,900 acre-feet applies to. The statement made no comparison as to what percent of the projected water demand for the area would be utilized by each company with plans of development within the study area. The reference to the proposed project is unclear as to which proposed project. The basis for estimating the water requirement for the study area has been explained in a response to a previous letter (Sierra Club).

54. Bureau of Outdoor Recreation

Comment: Regional Analysis (Volumes I & II) Recreation Resources, Volume I, page I-347. In describing existing hunting and fishing opportunities, quantitative information on current use by residents vs nonresidents is necessary to determine the value, economic and otherwise, of visits by out-of-state hunters and fishermen. Other recreation resources should be similarly treated.

Response: Changes that better reflect current nonresident and resident participation have been incorporated into the text (Volume I), of the FES.

These figures were taken from the revised (1973) Wyoming Comprehensive Outdoor Recreation Plan.

Comment: Any unique hunting and fishing resources should be identified and quantitatively related to the total availability of such resources. The statement identifies the Powder River Basin antelope harvest as approximately 50 percent of the total State harvest (p. I-347, par. 3). Further quantification is needed to relate the area harvest to the total harvest in North American since antelope hunting is a recreation resource unique to limited areas of the continent.

Response: Reliable North American antelope harvest data is unavailable for inclusion in the FES. However, an additional statement to the effect that Wyoming's antelope are 50% of the worlds population has been incorporated.

Comment: Waterbased recreation, skiing and snowmobiling are mentioned and illustrated in this section, but no quantification is included and thus it is not possible to judge the importance of these resources. We suggest that the final statement should include factual information concerning acreage, visitation, and projected supply and demand for these activities.

Response: Changes have been made in Volume I for appropriate recreation visitation, addressed in the State's Outdoor Recreation Plan. However, supply and acreage was identified in the DES, Table 33, Appendix C. Projected demand is illustrated in Table 36, Appendix C.

Comment: In discussing the recreation resources of the project area, we believe the statement should address the resources and opportunities available in the urban areas. Although we recognize the importance of hunting and fishing in Wyoming, the predicted influx of people to the urban areas by the 1980's and the simultaneous decrease (in acres) of available recreational land, make it increasingly important to provide a higher quality and larger quantity of recreational experiences within the cities and towns.

Response: The addition has been made to Volume I, in the EIS.

Comment: Included in the discussion of urban recreation should be an assessment of present use and predicted use levels as a result of the increasing population. Table 33 would become more meaningful if it included data on the recreation days of use at each of the listed facilities, and the present capacity of same. From population projections and the resource inventory, some sort of demand analysis should be devised whereby one could estimate future demand (1985, 1990, etc.) for certain types of activities in each particular area. Amount of land (acres) and types of facilities which will probably be in greatest demand could be estimated, along with their dollar cost, from the projected demand figures.

Response: Visitation shown on Table 33 is sketchy, mostly representative of management intensity, e.e., National Parks vs. undeveloped recreation land. The Wyoming Comprehensive Outdoor Recreation Plan identifies the lack of historical participation data. The new Campbell County Recreation Study (July 1974) makes no reference to current visitation, recognizes the need to collect it and bases their projections upon standards established by the National Recreation and Park Assoc. standards, keyed to the number of facilities required per thousand population. Predicted use levels for the region are provided by the Wyoming Recreation Commission in Table 36.

The statement refers to Tables 33, 35, and 36 and the Campbell County Recreation Study for data in making a demand analysis for any early urban recreation needs. Further visitor use, carrying capacity and recreation land use data needs to be collected from public lands.

Comment: The statement should include reference to the historic Oregon and Mormon Trails currently being studied by Federal, State and local participants

as potential additions to the National System of Scenic Trails. Impacts on the trails, both primary and secondary, occurring due to the coal development projects, need to be assessed, and measures to minimize harm to these sensitive areas should be described.

Response: Addition is made to Volume I noting the study of the Oregon and Mormon trails for potential additions to the National System of Historic Trails. Emphasis also is added to the impact section of Volume I.

Comment: Probable Cumulative Regional Impacts, page I-537, Volume II. The water base will be substantially affected due to large changes in use which would occur. Where possible, the losses to recreation in terms of degraded water quality and acre-feet available, and the resulting effect upon visitor days should be quantified. The impact of removing water based recreation from an area with a shortage of water will be severe. The possibilities for alternate and supplementary sources of water supply need to be addressed in the statement.

Response: Until adequate monitoring systems are established to effectively measure surface and underground water quality effects from mining, as well as the probable locations and effects upon a recreation resource, the analysis cannot be prepared.

Existing water rights, i.e., Keyhole Reservoir, provide no opportunity for preserving a recreational reserve, loss of which will be an impact but unrelated to coal development. Future reserves may allow a negotiated or voluntary commitment to recreation, but under existing state water law and basin compacts there is no priority over industry and agriculture. Recreation visitor days are more secure under a strong reserve for agriculture--impact would be greatest by this conversion. Some positive visitor use may be gained by industrial development, more effectively changing the historical patterns of recreational use, i.e., boating from hunting and stream fishing.

Comment: In general, the relationship between increased demand and reduced supply of recreation resources needs to be stated and quantified as an impact of the proposed action. Such quantified impacts should be developed for each recreation opportunity currently existing in the study area.

Response: It is expected that only a few of the more organized recreation uses, i.e., urban recreation and downhill skiing, could be analyzed with any significant improvement to the statement. Most popular recreation uses such as hunting and fishing involve water and land use not totally public or privately controlled. These immeasurable factors make it difficult to provide a good supportable relationship between increased demand and reduced supplies.

This response was received too late to allow evaluation of the urban sector and proper confirmation with city planners. However, there are studies being conducted in these cities that could support further analysis at a future date.

Comment: (Analysis of Proposed Mining and Reclamation by Atlantic Richfield Company, Carter Oil, Kerr-McGee, and Wyodak Companies - Volumes III and IV - Parts III, IV, V, and VI) Present use patterns on all leases and their adjacent areas will be altered. Also, recreational access to these sites will be greatly improved. Considering these two facts, a change in types of use would probably occur on these areas (i.e., hunting to ORV use). Although net use will probably increase only slightly, some attempt should be made to determine the uses which will become most popular in the future.

Response: Assuming that the predominance of private land on or adjacent to the leases allows recreation use, the most popular future use in the basin will be off-road vehicles. If these private lands remain closed to hunting and ORV use as they are today, mining will not alter recreation use. The positive effect of more access roads will open some public land to both hunting and ORV use. ORV use would be the most popular year-round activity on these public lands.

lands.

Comment: The major activity to be impacted significantly by this proposal would be hunting on the Carter Oil lease north of Gillette. We note on page IV-119 that access restrictions to the area will be imposed by 1990. The types of restrictions and the resulting impacts these may have on hunting should be explored in the statement.

Response: This access restriction was illustrated to indicate the loss of hunting opportunities over the major portion of the Carter lease by 1990 because of the need to provide safety for the worker in the mine.

Comment: The leases granted to Kerr-McGee and A.R.Co. are located in the same township. The cumulative impacts of these two leases on the surrounding area should be treated in the statement. Also the draft should specify the distance at which noise impacts would be damaging or annoying to recreational activities and wildlife.

Response: The impacts that could be identified on a cumulative basis are discussed in the regional analysis. The noise level is not expected to affect recreation activities or wildlife as discussed in the revised regional analysis.

Comment: In discussing the A.R.Co. lease on page III-88, under Description of the Existing Environment, recreation is discussed thusly, "Recreation can best be described as people doing things for their physical or psychological well being. There are few activities that occur on this lease area that serve these needs." We find the definition so broad as to be basically inaccurate. Conceivably one might undergo surgery or undertake psychoanalysis for his "physical or psychological well being." Overall, we regard the two sentence discussion as inadequate and possibly inaccurate in view of the facts presented on page III-118, under "Probable Impact of Proposed Action." It is indicated that mining

will eliminate approximately 500 acres of hunting area and the 100-acre Reno Reservoir on a leasehold which is described as "virtually without recreation resources."

Response: Because of their location near population centers, Keyhole Reservoir and Glendo Reservoir accommodate large numbers of people for water skiing, boating, fishing, swimming, scuba diving, etc. The 57 acres of Reno Reservoir could be considered as having minimal recreation potential. It is on private land and was originally constructed as a stock water facility. The 500 acres lost to hunting is minimal when compared to the total area available to hunt.

Comment: The replacement of Reno Reservoir as a mitigating measure (p. 11-139) is commendable. However, more detailed information would be desirable, including the parties responsible for this action, the impacts of construction, and the expected effect of the new reservoir on regional recreational use.

Response: Due to the fact that the reservoir is on private land much information was not available. The mining plan stated that a reservoir of comparable size would be constructed.

Comment: (Significant Mitigating Measures, Ch. VI, and Alternatives to the Porposed Action, Ch. VIII.)

"A rigorous exploration and objective evaluation of alternative actions that might avoid some or all of the adverse environmental impacts is essential," according to Council of Environmental Quality Guidelines. The discussion of mitigating measures for recreation (p. I-641) is wholly inadequate in that it merely restates statutory provisions without discussing their relation to previously identified adverse impacts. Definite mitigating measures should be described in the final statement. Included in the plans for constructing and

operating the coal development facilities should be measures to minimize erosion and sedimentation, and specific plans for maintenance of sewage and waste treatment facilities. Since 26 percent of the recreational land from the project area will be committed to other use, some means of mitigating or replacing this loss should be discussed. Mitigating measures for meeting increased recreation demand should also be presented.

Response: Many potential impacts have been identified with a supporting discussion provided. Some strength and correlation can improve the mitigation section and this has been done.

Many opportunities may exist for meeting increased recreation demand or substituting potential land losses, but the authority to resolve these issues exists in the few described statutory provisions. To suggest other solutions without statutory authority may fall far short of actual mitigation.

Comment: The discussion of "Alternative Reclamation Objectives" (pp. I-687 to I-692) is inadequate in its treatment of wildlife habitat, recreation and multiple use. This section is in no way a rigorous exploration or an objective evaluation. The discussion of reclamation of wildlife habitat contains statements on erosion and sedimentation which are inconsistent with previous statements (see "Surface Protection and Reclamation," p. I-632, paragraph 3). Impacts identified with reclamation for wildlife habitat and recreation are all adverse with no consideration of either possibility as a mitigating measure or a beneficial use. The section on multiple use is a generality which is inadequate for an analysis of an alternative's impacts.

Response: Page I-632 speaks of erosion control and providing greater opportunity for diverse landuse with respect to the desirability of a specific

mix of vegetation. Within the alternative reclamation objectives section, erosion and sedimentation are discussed in terms of the steeper and rougher topography.

Adverse impacts were identified for all the alternate reclamation objectives discussed. All the uses were discussed in greater detail within their specific texts within the main body of the EIS.

Comment: Analysis of Proposed Railroad Construction and Operation by Burlington Northern Inc., and the Chicago and North Western Transportation Company (Volume III) Part II.

The impact of the railroad on the development of other known potential federal coal leases, privately owned coal, and other mineral resources should be discussed fully. The rail line is not inherently limited to use for the coal leases included in the study and, in fact, other potential resource developments are known (see Volume V, "Appendices," Maps 4 and 5). Increased transportation access could have an impact on such developments and subsequent impact on all of the factors previously identified for the proposed action, including recreation.

Response: It is recognized that the proposed railroad will aid in the development of other known potential federal coal leases, privately owned coal and other mineral resources. To the extent possible other potential coal developments have been projected and the total cumulative impacts discussed in the regional part of the statement. The use of the railroad for development of other mineral resources, such as uranium, is expected to be slight since raw uranium ore will be milled and concentrated prior to leaving the basin. Because of the concentration process the quantity of material shipped will be small.

Comment: The statement recognizes that recreation use generated by the population increase from railroad construction will cause overcrowding and deterioration of existing recreation facilities in Douglas and Gillette. A thorough analysis of the impacts which could occur on the various urban facilities should be included in this section.

Response: The population increase from all development (including the railroad) is stressed in the regional analysis. Therefore, reference to urban

recreation impacts will be expanded to include a chart for future facility and park projections for Campbell County. This chart, with that already illustrating future county expansion plans (Tables 35 and 35a, Appendix C, Volume V), is the only supportable data available at this time. Population estimates used on the chart include the effects of total development, not just the railroad.

The only current study applicable to this subject is the Campbell County Recreation Study (Gillette) and Table 35, Appendix C, for Converse County (Douglas) prepared by the Wyoming Recreation Commission. The Campbell County plan, using other population projections, uses a nationally recognized standard for facility needs. This projection will be recognized here.

Comment: A detailed discussion of impacts on the Thunder Basin National Grassland should be added to the final statement. It is mentioned that this area has "good recreation opportunities," and that the proposed route crosses approximately 21 miles of the area.

Response: The Thunder Basin National Grasslands is recognized in the statement as a federally managed multiple use area, including recreation.

55. Environmental Protection Agency, Region VIII

Numerous comments contained in this letter have been responded to previously in this volume.

Comment: Wells and livestock ponds to be destroyed by the construction should be located on maps and mitigating measures to compensate for this loss described.

Response: Mitigation or compensation for reservoirs and wells on private land are subject to negotiations between the landowner and companies involved. This may be incidental to the purchase of the property or right-of-way.

Comment: Adverse effects upon livestock and wildlife from increased erosion, sedimentation, noise, and herbicide damage should be quantified to the extent possible.

Response: The available information concerning loss to the factors described is not possible as insufficient information is available to express these losses in quantified terms.

Comment: A section of the report (in Part II) should document the State and Federal regulations controlling waste discharges.

Response: Stipulations included in the granted railroad rights-of-way will require the companies and their agents to comply with all applicable state and federal laws and regulations during construction and operation of the railroad. A more detailed listing of those laws and regulations would not enable a better understanding of the impacts.

Comment: There should be a specific commitment, with a proposed plan, to reclaim barrow pits, exploration cuts for construction materials, and waste disposal sites (in Part II).

Response: Mitigating Measures (pages II-132 and II-134) require reclamation of all disturbed areas, both on and adjacent to the railroad right-of-way. Stipulations included in the granted rights-of-way will require such reclamation.

Comment: Information is needed regarding the environmental effect (erosion, flooding, and water quality) of railroad induced drainage modifications.

Response: These impacts are described in Part II, Chapter III, Water Resources (pages II-98).

Comment: Compliance with the standards for NPDES permits for discharges emanating from railroad facilities and right-of-way, along with discussion of the technology adequate to comply, and alternative schemes for compliance, should be discussed.

Response: The details of compliance requirements for applicable laws and regulations (including National Pollutant Discharge Elimination System) will be included in rights-of-way stipulations.

Comment: The effect of fires created by the railroad is not adequately quantified. Between 1971 and 1973, 40 percent (103) of the fires in Campbell and Converse Counties were railroad caused. This present system is 176 miles in length, compared to the 150 miles of new line proposed, and has significantly lower traffic density. Therefore we feel the estimate of 10 to 50 new fires per year to be low since on a percentage mileage basis the new track could cause 90 new fires per year. This could also be higher due to the increased traffic flow. Preventive fire measures should concentrate on the source of the spark rather than in the fuel supply adjacent to the right-of-way.

Response: The estimates assume that the addition of the now required fireguards (State of Wyoming requirement), retention type spark arrestors on locomotives and fuel additives would partially mitigate fire occurrence. The impact section in Part II, Volume III covers only the proposed 113-mile railroad construction, not the total number of miles expected to be constructed in the study area of 1990 (150 miles).

Comment: Air emissions at the anticipated level of rail traffic need to be discussed in terms of the impact upon ambient conditions and the issue of significant deterioration. The emission estimate should be included in a modeling estimate of ambient air quality for the region.

Response: A regional air quality model was not available for predicting changes in ambient air quality. Present ambient air quality data and meteorological data are almost nonexistent for the area of the proposed railroad. Based on available data, the impact of rail traffic emissions would not be expected to result in "significant deterioration" of air quality.

Comment: The total noise impact from this project could have a significant detrimental effect upon the population centers near Bill and Douglas. Noise may also adversely affect livestock reproduction. It is possible, from the estimates given in the report, for a single location to receive over two hours of 98 decibel level noise per day every day of the week. (Based on 46 trains per day estimate of 1990 traffic flow.) A better estimate of the effects on livestock should be prepared and an analysis of compliance with proposed or adopted state and local noise regulations.

Response: Under section 17 of the Noise Control Act of 1972, P.L. 92-574, the Administrator of the Environmental Protection Agency was required to publish

proposed noise emission regulations for surface carriers engaged in interstate commerce by railroad within nine months of passage of the Act. Once these regulations are established, no state or political subdivision thereof may adopt or enforce any standard applicable to noise emission for railroads unless identical or less strict than the regulation. In this manner, the Act effectively preempts state and local enforcement of noise regulations.

The referenced regulations are required under section 17(a)(1) to reflect the degree of noise reduction achievable through the application of the best available technology, taking into account the cost of compliance. The proposed standards, published in the July 4, 1974 Federal Register, establish the following standards for locomotives:

"A. Locomotive standard. All locomotives to which this regulation is applicable are to meet the following noise emission standards under stationary test conditions:

"(1) Effective 270 days from the date of promulgation of these regulations locomotives tested singularly shall not exceed 93 dB(A) at any throttle setting and 73 dB(A) at idle when measured at 30 meters (100 feet) over any surface.

"(2) Effective 4 years from the date of promulgation of these regulations locomotives tested singularly shall not exceed 87 dB(A) at any throttle setting and 67 dB(A) at idle when measured at 30 meters (100 feet) over any surface.

Similarly, all locomotives or combination of locomotives to which this regulation is applicable, are to meet the following noise emission standards under moving conditions:

"(1) Effective 270 days from the date of promulgation of these regulations, 96 dB(A) when moving at any time under any condition of grade, load, acceleration, or deceleration as measured over any surface at 30 meters (100 feet).

"(2) Effective 4 years from the date of promulgation of these regulations, 90 dB(A) when moving at any time under any condition of grade, load, acceleration, or deceleration as measured over any surface at 30 meters (100 feet).

"B. Railroad car standard. Effective 270 days from the date of promulgation of these regulations, all railroad cars or combination of railroad cars operated by surface carriers engaged in interstate commerce by railroad are to meet a noise emission standard of 88 dB(A) at speeds up to and including 72 km/hr (45 mph) and 93 dB(A) at speeds greater than 72 km/hr (45 mph) when measured at 30 meters (100 feet) over any surface."

These proposed regulations have not become final; therefore, analysis of compliance cannot be attempted at this time. It is assumed, however, that compliance with the final regulations and set standards will occur.

Bill, Wyoming, at the present time cannot be termed as a population center and the proposed railroad does not pass through Douglas.

The effects of noise on livestock cannot be estimated in quantified terms based on existing information. Livestock can become well adjusted to frequent noise and after a period of acquaintanceship, respond very little to the disturbance.

Comment: Alternative routing along the western route should receive additional evaluation. EPA favors this alternative route for the following reasons. This route would parallel an existing highway, thereby reducing the aesthetic impact on the region. According to the report it would also reduce negative effects upon livestock grazing, wildlife, recreation, and water quality (p. II-166). The western alternative route generally follows the ridgeline of the area therefore crossing most streams and gullies at a higher elevation which would reduce subsequent erosion. Fire damage might also be reduced for two reasons: the fire may be spotted sooner from the road and a fire would not spread beyond the road. The proposed route, unlike this alternative route, would isolate the wildlife range between Highway 59 and the railroad. We also urge further consideration of this route since it will pass through nine fewer miles of federally owned land.

Response: To the extent that data was available the western route was evaluated and the analysis set forth in the FES. The FES makes no recommendations concerning the proposed actions.

Comment: Additional information and maps are needed to describe and locate the major bridges, livestock crossings, sidings, new wells, disturbed wells and reservoirs associated with the project, in order to determine the impacts of the project.

Response: The impacts were analyzed with available information. The location, number and type livestock crossings, new wells, etc., are subject to negotiations between the railroad companies and local ranchers. Many negotiations have not been completed and the unavoidable impacts would be highly dependent on this information. The bridges are identified as to location by drainage on page II-7. The location can be determined on Map 12 of the Appendix. Specific design information, however, was not available.

Comment: Upon reviewing the draft EIS for the Black Thunder Mine we find the description inadequately describes the proposed plan; it does not sufficiently provide information on water quality impacts and land use impacts, nor does it provide sufficient detail of the proposed monitoring plan.

Response: Four alternate methods of diverting water from Little Thunder Creek around the mine area are described on pages III-13, III-14, and III-19. Impacts of the mining, including those caused by diversions, are described on pages III-106 to III-109. Since issuance of the DES the company has revised their mining plan. These revisions are reflected in the FES.

Comment: The description of the proposed project covers mining only in the center of the acquired lease until the year 2000 yet some of the impacts described cover the entire lease. This issue should be resolved. Either the proposed mining plan should detail procedures for the entire lease or, preferably, only on the first 20 years of mining. At that time a new mining plan should be filed. This would be consistent with BLM stipulations that leases are

subject to reasonable readjustment of terms on a 20 year basis. Then an environmental assessment should be prepared followed by a decision on preparation of another EIS.

Response: The mining and reclamation plan submitted by the Atlantic Richfield Company covered the development of a specific portion of their Federal leasehold as described in this portion of the impact statement. Additional mining on the leasehold will most likely utilize the mining methods and equipment described in this statement.

Upon submission of a plan to develop additional areas of the lease an environmental assessment will be made on that plan by the U.S. Geological Survey. If that assessment indicates the need for another impact statement, the Secretary of the Interior reserves the right to require one. Nothing in the present statement is intended to circumvent this determination or action by the Secretary.

Comment: Description of the mining procedure lacks the detail needed to determine if adequate reclamation procedures are followed. It is stated that toxic soils or overburden found to be deleterious to vegetation will be buried. Criteria levels used to determine this should be listed as well as operating control techniques used to accomplish this goal. Movement of trace elements after mechanical disturbance is not appropriately analyzed. Atlantic-Richfield asserts that, "Preliminary tests indicate the overburden does not contain any toxic materials", (p. III-46). Subsequent tables show zinc running between 90 and 240 ppm; strontium from 120 to 370 ppm; titanium from 1,100 to 3,500 ppm; and significant levels of vanadium, molybdenum, and uranium. Detailed analysis

regarding mobility, toxicity, and concentration of these substances in the ground water and ecosystem should be included in the report.

Response: The items in the comment are discussed and analyzed in the revised mining and reclamation plan submitted by Atlantic Richfield. Details on trace elements are contained in a section added to Part I, Regional Analysis, titled "Trace Elements in Coal and Overburden".

Comment: This particular lease is adjacent to other federal coal leases to the south and north. The statement indicates these operations will not interfere with A.R.Co. procedures. However, intercompany coordination of plans could reduce final high walls, eliminate reduction of facilities, or assist in both drainage control and monitoring. This mining plan should discuss these interactions.

Response: The coordination of the necessary monitoring, mining, and reclamation procedure is accomplished by the Area Mining Supervisor among individual operators as well as among the working areas of individual mines. This coordination is directed to the exchange and dissemination of critical data among operators and also the optimum design of surface features which continue from lease to lease.

Comment: Final land surface as shown in Figure II indicates no reduction of high walls. In order to comply with lease stipulations this would have to be reduced to a 4:1 slope. However, we recommend that in order to facilitate revegetation efforts and reduce water quality impact, this be further reduced. To accomplish this and still recover the full amount of coal to the lease edge, BLM should consider granting special permits beyond the lease to acquire backfill material to knock down the remaining highwall provided there are no economically strippable reserves in this area.

Also to minimize environmental effects, we highly recommend that the initial cut slope material be returned to the final highwall area to further reduce final slope of the mined area.

Response: The final land surface shown in Figure 2 was a theoretical possible land configuration based on a very limited set of criteria. The text and figures in the final statement are revised giving a more accurate picture of the land surface based on a truck and shovel extraction operation.

The 4:1 slope for the highwall could not be found as a stipulation in the lease. The slope of the final highwall is subject to determination by the supervising agencies and will meet requirements and regulations in effect at the time the highwall is reduced. At the present time no reclaimed areas in the mines are to exceed slopes of 3:1.

The federal agencies involved in supervising the operations will consider the other recommendations of the Environmental Protection Agency in adding reclamation stipulations to the plan approval.

Comment: Water sources in this region are governed by prior appropriative rights. The generalities regarding water rights in the statement do not permit quantification of water supply. The statement gives the impression of water scarcity - " . . . during most years only those rights with a priority dating before 1900 have a dependable water supply during late summer months." (I-258). There is no table to show what this means in terms of acre-feet and the number and location of water rights. What percentage of the rights have a dependable supply? How many water rights located in northeast Wyoming and how would they be affected with new dams and ground water wells? There are suggestions that present surface uses might suffer significant impacts, but where and by how much? The statement says the amount of water to be obtained from surface and ground sources

cannot be determined and that each company, within legal constraints, will develop their own water. (I-490-491). This environmental impact statement does not assess water use impacts with specific knowledge.

Response: Water supplies from surface runoff are not dependable anywhere in the study area. For this reason, very little irrigation is practiced. It is necessary for ranchers to have stockponds or wells in order to have a dependable supply for livestock consumption.

It was impossible to properly assess impacts of water-supply development because many of the companies have not yet identified their sources.

Comment: Water quality and quantity impacts could be severe at this location since the Little Thunder Creek crosses the lease. Estimates of average flow and maximum flow should be obtained prior to design of the mine in this area. If the mining plan cannot practically exclude this area from mining, then several years of baseline data should be obtained to adequately design this area prior to mining.

Response: These estimates were determined, and are given on page III-66.

Due to the high variability of streamflow in this area, several years of data would not be adequate to describe baseline hydrologic conditions.

Comment: The four alternatives as presented in the report are not addressed in sufficient detail to determine impacts. Topography of each scheme should be mapped; and power use, sedimentation problems, downstream water use, and leaching impacts should be quantified and discussed. We feel that a reservoir acting as a sedimentation pond and pumping across the mined area is the best alternative provided power requirements are not unreasonable high. After mining is complete, restoration of the original stream slope through the mine should be achieved if possible. If not, deepening on the eastern side should be done to prevent ponding in the mined area. Regarding ponding in the exhausted area, under the mitigating measures section, it says, "upon shaping of the spoil into the final land form, no

closed interior ponds should be permitted to form", (p. III-124). Yet Figure 2 shows five such depressions. We recognize it will be extremely difficult to eliminate closed drainages due to the overburden-to-coal ratio, and therefore much additional information should be prepared regarding these features.

Response: The text has been modified in accordance with the revised mining and reclamation plan submitted by Atlantic Richfield Company. Figure 2 in the impacts on topography section has been recompiled to illustrate flow-through water impoundments along the restored drainage.

Comment: Monitoring as described for this mine may be sufficient but additional features of the program should be indicated in the environmental impact statement. Air quality and meteorological stations should be located on a map, the equipment described, the duration of the data acquisition and most importantly the parameters measured should be stated. The same information is needed regarding the water quality monitoring system. Ten wells inside the lease and ten wells outside sounds like good coverage but these locations should be specified. Areas to be covered include ground water discharge areas, areas up and down gradient to underground flow, and on the perimeter of the drawdown areas. Of course the parameters monitored should be listed. A surface recording station might also be installed north east of the lease on the North Prong of Little Thunder Creek. These stations should be located on the lease map.

Response: Concur; however, local conditions will have to be studied further before the location of streamflow stations or wells are installed. A complete monitoring program can't be established in detail before mining operations begin. The monitoring program will have to be evaluated and adjusted as data are gathered and analyzed.

Comment: However, impacts to water quality, ground water supply, surface disturbance, and the monitoring systems to record these impacts are not adequately described.

Response: Impacts to water quality and groundwater supply were described to the extent possible considering the amount and detail of data available for the area.

Comment: The mining plan indicates the final highwall will be reduced to a 2:1 slope, the coal seam covered and area revegetated. The plan looks sound in this respect. However since the final highwall is within Carter's lease it may not have to be reduced and could be carried on through the area during future mining. The plan indicates that 650,000 cubic yards of overburden from the initial boxcut will be placed in a ravine between clinker hills. This procedure will increase sedimentation, erosion and possibly leach toxic elements into surface streams. Rather than place the material in such a depression alternative dumping sites on topographic highs should be investigated. This material should be covered with topsoil and revegetated, then, upon completion of the mine, re-deposited in the final cut.

Response: The comments and suggestions of the Environmental Protection Agency will be taken into consideration at the time of the final disposition of the highwall, and initial boxcut spoil.

The spoil from the boxcut, as described in the company proposal, will be located in the head of the ravine and will be used to form part of the grade for the proposed relocation of State Highway 59 as shown in Figure 4, Chapter I, Part IV.

Comment: Sewage and other liquid waste handling systems are not sufficiently described in the report. It is not appropriate to only state that, "sewage and liquid wastes will be treated in a waste disposal system in a manner that conforms

to government requirements", (p. IV-31). A brief discussion of such regulations should be presented as well as a complete but brief description of the proposed system.

Response: The details of the sewage and waste disposal system have not yet been decided upon by the mining company; the system will be required to meet all state and federal regulations.

Comment: (North Rawhide - Carter Oil Company) - The plan indicates that 100 acres of the lease area are prime winter range for antelope, yet this area is not indicated on any map. Mitigating measures to offset wildlife impact should be included such as delaying mining in this area, if possible or augmentation of range areas beyond the lease.

Response: Refer to Volume V, Appendices, Map 9. This map has been revised in the FES to allow the reader to better analyze the relationship of the North Rawhide mine area to important pronghorn antelope range.

Comment: The use of herbicides (Part IV, Carter Oil Company) is indicated for two purposes; to control weeds along the railroad right-of-way and to control noxious and toxic species of invader plants in the mined area. Additional detail that needs to be provided regarding this procedure includes: name of target species, herbicides used, application rates, frequency of application and discussion of potential impacts

Response; Data were not available and were not compiled as to plant species, herbicides to be used, and rate of frequency of application. However, such information would be required (by stipulation) prior to actual use of such herbicides. Impacts would be similar to those described in Part II for the railroad (pages II-98, II-101, II-110, and II-117).

Comment; Water quality impacts are not adequately described. According to the plan, water will be pumped from the seepage ponds in the active mine. This procedure, depending upon water quality, may require permit approval from this agency. Discharge permits must be approved 180 days prior to any discharge. An estimate should be made of the degradation of water quality from increased erosion and sedimentation. To reduce erosion and sedimentation it is noted that surface water will be diverted away from unprotected disturbed areas. A description of this procedure, and the procedure used to channelize Rawhide Creek and to prevent other runoff from entering the mine should be indicated. Rawhide Creek bisects the lease area; it is suggested that once channelized, mining be diverted from this area. In any event the original stream slope from mine entrance to mine exit should be maintained.

Response; Estimates of degradation to water quality would have to be speculation because the amount of seepage that will be discharged to stream channels is not yet known.

Comment: The impact due to the 500 acre depression within the mined area should be discussed. The plan indicates this will be a lake with sufficient water recharge from the surface mine to maintain a fresh water condition. A water budget which details aquifer discharge and total evaporation should be prepared from aquifer test data.

Response: The water quality of such a lake is questionable. Impacts of this 500 acre depression are discussed in the various sections of Chapter IV, Part IV.

Comment: Decrease of groundwater supply in the area is not fully detailed. The report indicates the aquifers will be destroyed but the hydrologic characteristics of the replaced overburden are not described. Since the cone of depression will be beyond the mined area, 4 to 8 miles according to the statement,

a contingency plan should be adopted to replace any wells which are lost. Water consumption can and should be estimated for the final statement. For instance, operations in Montana on a similar size mine of 5 million tons per year, indicate water consumption for all operations at 140,000 gallons per day. BLM should require the companies to make these estimates and indicate the source of water.

Response: Better analysis of dewatering data from the Wyodak and the Amax South Mines show that water levels will be affected for about two miles and in some cases much less than 2 miles. The final statement has been revised accordingly. The hydrologic characteristics of the replaced overburden cannot be described until testing and monitoring have been underway for an estimated two years. Wyoming water law protects domestic and stock wells and any wells destroyed or damaged must be replaced by the coal company. Test drilling and testing by the Northern Great Plains Resource Program near both the Decker Mine in Montana and the Wyodak Mine in Wyoming shows that there is much more water in the coal at the Decker Mine than in the coal at the Wyodak Mine.

Comment: Monitoring procedures are not fully detailed. Eleven monitoring wells are listed for the lease area but additional ones are needed to cover off site impacts. Several wells up and down gradient of ground water movement should be included. Distant wells should be dug at or near the extent of drawdown area and existing wells in the area should be monitored. Additions to the list of parameters to be measured should include the trace elements in the coal and the toxic heavy metals in the overburden. These parameters should include, in addition to these indicated: U, MO, Cd, Co, Ni, Be, F, Se, Hg, Pb and As, as well as pesticides. Location of the meteorological stations should be indicated. Air quality parameters should be listed. Since some diversion of surface waters is contemplated in the area of future spoils piles, frequent measurements for pH and

common ions, periodic measurements for selected trace metals known to be present in the coal beds, and frequent measurements for turbidity and/or suspended solids and dissolved solids should be conducted.

Response: Monitoring programs are being established at this time. Some of these programs are in consultation with the Water Resources Institute at the University of Wyoming and some are with the Water Resource Division of the U. S. Geological Survey. Controls will consist of the Federal Water Pollution Act, as amended in 1972, and the Wyoming Environmental Quality Act of 1973.

Comment: Water quality impacts should be more fully analyzed. It is planned to pump water from surface aquifers which flow into the remaining pits to a settling pond outside the lease area. The water will be treated, if necessary according to the report, before discharge. The general procedure is sound for this method, however, in order to determine the impact, the following information should be provided; estimate of amount and quality of water, criteria for requiring water treatment, and the method of treatment. It is stated that catchment ponds will be built where they are required and serve as settling ponds, livestock water ponds, and evaporation ponds. These uses may not be compatible. Location of these projects should be preliminarily indicated. A further description is needed to describe the project perimeter ditching around the high side of the active mine. Where will this water be diverted? A permanent diversion ditch is suggested near the northwest corner of the lease to prevent runoff from entering the mine. The planned diversion channel for North Prong Creek is neither located on an appropriate map nor its design indicated.

Response: The main channels of Little Thunder and North Prong Little Thunder Creeks are intermittent streams. Flow generally exists in these streams for a total of less than 30 days per year. If production waters are released to natural streams, one of the major adverse impacts would be the change in

channel form and size as it adjusts to the increased flow.

The amount of seepage encountered during mining is expected to be low, and disposal does not appear to be a problem. Much of the water can probably be used for dust control. If evaporation ponds are also used for excess seepage, water quality impacts on natural flows should not be a problem. Pages I-617 and I-618 of the draft explain the laws that must be adhered to in case some release of production waters is necessary. These laws also specify water quality standards.

Full company plans and operations detailing such information as water quality treatment are contingent upon the amount of water encountered during mining.

Four alternate plans of diverting the water from Little Thunder Creek are presented on pages III-13 and III-14 of the draft statement.

Comment: The source of supply and an estimate of water use for the mine are not indicated. This should be done in the final statement. Measures to replace lost wells due to mining activity should be included. A map indicating areal extent of serious aquifer drawdown should be prepared.

Response: The mining companies plan to use water from pit dewatering as their water supply. Wyodak pumps approximately 208 gallons per minute (on a 24-hour basis) in dewatering. Amax South pumps 80 to 90 gallons per minute in dewatering. Most of the water is used for dust control, wash down, and reclamation watering.

Measures to replace wells lost due to mining are explained in the Mitigating Measures of Volume II, Wyoming water law protects both the supply and the water right.

Serious lowering of water levels will be mostly limited to the lease area. Little drawdown, if any, is expected beyond two miles.

Comment: Kerr-McGee Corp., has provided a rather thorough trace element analysis of coal, (although mercury was not on the list), but an analysis of significant quantities and their potential effect on the ecosystem should be included.

Response: Additional information on trace elements has been added to the FES. (Refer to Hearing Comments and Responses.)

Comment: This section of the report does not even detail the area to be covered by the mining plan. The map on page VI-5 and the accompanying text indicates only 400 acres are covered by the plan. This area would be mined by 1988. Yet in subsequent chapters the impacts are given from mining on the entire lease, i.e., mining until 2012. Further, part of the impact section analyzes the effects due to mining on an entire township, most of which is beyond the Wyodak lease. This issue must be resolved. Either the mining plan is limited to the first 400 acres of operation or it should be expanded to give a map of mine development, description of final topography, high wall design, water control systems, monitoring stations, etc., for the entire lease area.

Response: The mining plan submitted by Wyodak Resources Development Corporation to the U.S. Geological Survey covered the development of the federal coal lease and adjacent private coal lands located south of the power plant complex. Mining on the coal leases north of the power plant will most likely be conducted in a manner similar to the procedures discussed in this statement. The plan to develop the north leases, when filed, will be subject to an environmental analysis, which could lead to the decision by the Secretary of the Interior, that an additional impact statement is necessary. Impacts analyzed by the draft impact statement assumed that mining would proceed on the other leases until 2012.

Comment: The new proposed 330-MW plant is not included in this impact statement. EPA believes this project is part of and contingent upon the sale of federal coal leases and approval of mining plans. Therefore a description of this project should be included within this report. Impacts from this new plant are significant and neither the public; nor EPA under its authority from the Clean Air Act, can determine the nature of these impacts unless the project itself is fully described. It is mentioned the EPA has granted a construction permit for this plant. Actually until June 1, 1974, EPA acted as legal authority for the State of Wyoming in the issuance of new source review permits. This review is limited to compliance with federal and Wyoming Air Quality standards. (The Wyodak plant will comply if the planned precipitators are installed). They do not imply EPA review of the entire project as would a review of a draft EIS. The issue of including this power plant in the EIS should be resolved by BLM as similar features are planned by this corporation and other companies; facilities which utilize coal obtained from federal leases adjacent to these leases. As such these projects constitute a federal action which would "significantly effect the human environment." Therefore, in order to comply with NEPA, this and similar mine-mouth power plants should be included in the EIS.

Response: The impact of this plant, which does not involve a federal action by the agencies preparing the EIS, was covered in the impact sections of Part I, as well as in Part VI. The only direct federal action involving this plant was issuance of the new source permit.

Comment: The plan neglects to describe in detail how water control systems will be designed. It mentions that Donkey Creek will be further channelized south of the area but maps locating this project, design cross sections, design flow, estimate of annual mean flow and the ultimate handling of this large drainage area are not included. The mining plan mentions the diversion of Donkey Creek around the mined area yet in the impacts section it indicates the creek will flow into the mined area. The statement on page VI-67 that, "Donkey Creek drops 80 feet at the highwall, then rises about 40 feet before it turns north, and finally rises another 40 feet at the burnline" is hydrologically impossible. It does indicate that water would pond in the mined area. If mining does eventually proceed south through Donkey Creek other alternatives to handling this flow should be considered. Some alternatives would be to dam at the western edge or channelize to the north-east and then dam. Then the water could be pumped across, carried across on an elevated culvert or channelized through the mined area and the eastern portion of the stream deepened to prevent ponding.

Response: Flow characteristics of Donkey Creek are discussed in the section on surface water. An estimate of mean annual flow was not made for the stream because sewage effluent from Gillette presently contributes to the natural streamflow. The company plans to use this effluent once Gillette completes their new sewage plant.

The mining plan suggests conversion of the pit to a lake once mining is completed; however, this plan does not appear to be feasible as is explained in the response to letter comment 19-8.

The text has been modified to rectify the incorrect description of the course of the stream. Alternatives to handling the flow have been incorporated in the text.

Comment: Air and water quality monitoring systems are not described in the needed detail. Water quality data is listed for six unknown locations at Donkey Creek, Wyodak Pit, Ditto Lake, and three wells. The parameters measured should be greatly expanded. (See previous monitoring plan reviews in this report.) In addition the water quality parameters at this mine should include bacteria; total coliform, fecal coliform, and fecal streptococcus, since Donkey Creek flow is primarily effluent from the Gillette sewage system.

Response: Wyodak has contracted with the City of Gillette to use effluent from the sewage plant as a primary source of water in the proposed power plant. Once the power plant begins using this effluent, downstream water quality will be improved. As the mining company is not responsible for the input of the sewage into the creek, it is questionable that they should monitor for the above mentioned items.

The mining and reclamation plan provided by Wyodak Resources Development Corp. states that "An ambient air monitoring program will be performed. . . ." No details are given as to location of air monitoring sites.

Comment: It is stated that scrubber water with fly ash will be treated before recycling and these concentrated wastes put in a settling pond. Yet our understanding is that the power plant will have only a dry control system, i.e., electrostatic precipitators. However, if a wet system is proposed, preferably the wastes should be dried, stabilized, and returned to the mine. If a settling pond is used instead, it should be lined or sealed and of sufficient capacity to prevent any overflow.

Response: However, the last written information provided by Black Hills and Pacific Power and Light Companies (April 1974) still considers both precipitators and scrubbers for particulate control. The companies have informally indicated that the electrostatic precipitators will be used.

Comment: Air quality impacts from this action will cause some deterioration of the present air quality. There is no apparent reason to list power plant emission without controls. This would violate New Source Performance Standards for steam generators. The impact section states that the health of the local population would be seriously affected. The condition described resembles a severe London smog alert. This is not the case. Actually according to the Northern Great Plains Resources Project report on atmospheric aspects, the estimate for maximum ground level annual concentrations for the Wyodak plant are minimal compared to the National secondary standards. These concentrations for particulates, SO_2 , and NO_x in ug/m^3 are 0.1, 1.3, 0.7 respectively. National secondary standards for these pollutants are 75, 80, and 100. (NGPRP, Work Group D Report, Atmospheric Aspects, p. 188). Thus the emissions given and impacts stated are completely inaccurate.

Response: The impact section has been revised (Part VI, Chapters III and V, Air Quality). However, the impacts cited are projected for not just a 330-MW plant at Wyodak, but for the converted Neil Simpson (20-MW), the new 330-MW plant in 1977, plus a new 450-MW plant in 1982 at the same location. The NGPRP report referred to, contained data only for the 330-MW plant, and did not consider Neil Simpson Unit 5 emissions nor the 1982 plant.

Comment: Other aspects of air pollution are not discussed or accurately analyzed. An estimate should be made of the quantities of the trace elements contained in the coal that are released to the atmosphere. An attempt should be made to quantify the impact of fugitive dust emissions from the mine. A 40% retention of SO_2 in the boiler seems unrealistically high; present figures indicate SO_2 retention of 15-20% in the boiler.

Response: To the limit of available data, trace elements were discussed but quantification was not possible. No quantification of dust was possible with available data. SO_2 emission data has been revised.

Comment: Impacts from surface disturbance are not fully addressed. The report mentioned previous experiments on revegetation in the South pit. The results of these experiments to date should be included. Maintaining a final slope of 35° will be too steep to facilitate reclamation plans so a reduction to 11° as proposed should be accomplished. It is not clear from the plan exactly what is planned regarding reclamation. The EIS states that approval of the plan will probably be based on recovery of the top 12 inches of overburden as soil material. Has this issue been decided? According to the report, the State of Wyoming must agree to plans for the interior depression and possible lake. Has this been done? The report says only 57% of the mined area can be reclaimed since 43% will have interior drainage with playa-like conditions. This percentage of reclaimed land is unacceptable. A better method is to plan for depressions in the mined area and minimize the areal extent of these areas. The final topographic configuration for the mined area and the undisturbed adjacent land should be shown in the final EIS.

Response: The lease for the south pit area requires that the land be reclaimed, but does not contain special stipulations for reclamation. Experiments have been conducted on spoil grading, topsoil replacement, and revegetation, but results are not yet conclusive. The detailed plans and the design of the lake as a final reclamation form have not yet been submitted to the State by the mining company. As stated in Chapter IV (Mitigating Measures), the restored land form shall be determined by consultations among the lessee, the appropriate land management agency, the State Lands Commission, and the U. S. Geological Survey. Agreements have not yet been reached upon which to base the final configuration of the mined area. The 43% of unreclaimable land will probably be under water of the lake.

Comment: Another revision in demand is that associated with industrialization and urbanization in the entire source area. This includes the western Powder River Basin and the Cheyenne River Basin. Estimates of these water demands should be included and the supply and impacts of water use analyzed over a constant region.

Response: The study area was considered to be the Eastern Powder River Coal Basin, and impacts were analyzed for that area. However, because water can be transported from areas of supply to areas of demand, it was necessary to identify these possible areas of supply, even though they were outside of the study area.

Comment: The water table will be lowered in the region due to the mining activity. Since the present water surface is shallow, shallow wells which are the main source for the livestock industry will be easily affected. Drawdown area estimates of 6 to 8 miles may be low in light of recent studies of similar conditions in Montana. These studies indicate minor drawdown out to 20 miles. The estimate that the basin receives 150,000 ac-ft/yr as recharge should be documented, located within the region, and the impacts addressed of tapping this source of water.

Response: Drawdown estimates of 6 to 8 miles are now believed to be considerably excessive for the coal in Wyoming. (See previous response in this letter.)

Comment: Some of the more important sources of water pollutants that are not addressed fully in the report are: accumulation of salts and toxic elements in low areas of the mines and their movement either through the aquifer and when pumped down natural drainages; leaching of chemical constituents not readily available in the stratified overburden that are suddenly available when the overburden materials are stripped and replaced in an unstratified condition; discharges from wet pollutant control systems from power plants, and the cumulative sediment

increase from regional construction activities. It must be noted with concern that the EIS gives no indication of whether or not there will be any difficulty in meeting NPDES permit requirements for run-off water and waste water discharges; in fact, the statement does not even indicate if there is any intention to comply with NPDES standards.

Response: The discussion of water pollutants is on page I-617, I-618 of the EIS.

Comment: The Air Quality impact analyses presented in the EIS were extremely qualitative and inadequate. It is difficult to arrive at the same conclusions regarding the severity of short and long term impacts based on such qualitative discussions. Air quality diffusion modeling should be employed to provide a more quantitative assessment of the possibility of violating the National Ambient Air Quality Standards. Granted that site specific data on air quality, meteorology, air pollutant emission rates, stack parameters, etc., are not available, but reasonable assumptions can be made to provide the necessary data input for the models. Modeling results could conceivably point out potential air quality problems. The Northern Great Plains Resource Program Work Group Report on Atmospheric Aspects, which includes a section on point source diffusion modeling for selected power plants and a "model" gasification plant, may provide useful information.

Response: A regional air quality diffusion model was not available for predicting cumulative air pollutant concentrations within the study area or region. Therefore, only qualitative impacts could be discussed. Site specific data was lacking as well as the siting for several projected power and gasification plants. The results of the NGPRP Atmospheric Aspects Work Group point source modeling for power and gasification plants could have been used in the DES if it had been available in time. However, it was received too late for incorporation in the

statement. Such point source modeling would provide some data as to expected increases in pollutant concentrations but would not provide background ambient air quality at proposed sites.

Comment: Even without such modeling efforts, somehow the report does make an estimate of ambient air quality for particulates, and as is typical for this report, the negative aspects are apparently over estimated. On page I-468 the statements reads, "Present ambient air quality is considered good (24 hour mean suspended particulates range from 13 to 60 micrograms per cubic meter of air, ug/m^3) versus a national primary standard of $75 \text{ ug}/\text{m}^3$, but it will decline with the development of complex pollution sources as industrialization takes place (24 hour mean suspended particulates could increase to a range of 20 to 200 ug/m^3)." It is not clear how these ambient air quality estimates were obtained. This should be shown in the report. The conditions stated would exceed the national 24 hour secondary standard of $150 \text{ ug}/\text{m}^3$. In addition resolution of the "significant deterioration" regulation may affect whether or not total development will be allowed to occur.

Response: The cited data on ambient air quality have been removed from the statement. The "significant deterioration" regulation has not been discussed since, as stated, resolution has not been completed, and lack of quantification of ambient air quality would have provided no comparative data.

Comment: Some of the problems noted in the discussion on air emissions from power plants include the estimates of SO_2 emissions which are low and must have assumed only 0.3% sulfur coal.

Response: Emission data have been revised including that for SO_2 .

Comment: Concern was expressed throughout the letter as to monitoring requirements within the development area.

Response: Authorities for requiring monitoring for the most part rest with permits issued at both federal and state levels. However, monitoring system requirements per se are not specifically required by law or regulations but are generally used to insure compliance with air and water quality standards.

Comment: The alternative of further developing eastern coal should be analyzed to develop an economic and environmental comparison chart between it and western coal. Eastern coal contains 34% more BTU's per ton and approximately 20% of this coal can be pre-cleaned of sulfur to bring it down to 0.7%S. Transportation cost would be reduced by utilizing eastern coal as it is closer to the power demand areas. Also there is an existing social structure based on mining in this region which could benefit from more jobs in that region. This is a national decision that should be based on minimizing detrimental human and environmental impact as well as maximizing energy production.

Response: Based on present estimates of future coal demand, both eastern and western coal fields must undergo extensive development to satisfy national energy needs. Much of the eastern coal which can be prepared to reduce sulfur content will be used to replace coal now being burned which is not responsive to sulfur removal during preparation.

56. Department of Agriculture

Comment: (Volume I, p. I-9) The SCS should be listed among the federal agencies, and its role discussed. Much of the surface is privately owned, e.g., of the 18,413 acres in the four specific application, 11,809 acres are privately owned. Practically all SCS technical assistance and soil survey activities are

carried out on private land, thus, its programs are extremely useful and beneficial in maintaining and improving land productivity and enhancing environmental quality.

(Volume I, p. I-12) The soil and water conservation commissions and soil and water conservation districts (subdivisions of state government) should be listed among state agencies.

Response: The paragraph introducing this section, page I-7, explains that the section will describe the roles of agencies having primary or secondary responsibility for authorizing or administering portions of the proposed developments. No attempt is made to describe, or even to list, other agencies which may have vital information, expertise or interest in either the developments or reclamation. The role of the Soil Conservation Service in surveying and classifying soils is described in Soils sections of the regional analysis and the Site Specific analyses.

Comment: (Volume I, p. I-62, paragraph 3) Delete the first sentence. Replace with paragraph as follows:

The nature and thickness of available topsoil shall be determined by detailed soil surveys of prospective mining sites. Grading plans will be based on the data thus provided. The objective of such grading shall be to create the soil best suited for plant growth, making optimal use of the available soil materials.

The research contracts investigating possible use of "other subsoil strata" result largely from the fact that it would be cheaper and generally not because of "lack of well-developed topsoil zones." If it is pertinent to include the ideas of the last two sentences of this paragraph, which we seriously question, the paragraph should begin, "A number of mining companies have contracted with

research organizations to investigate possible use of various geologic strata in the overburden to support. . . ."

Response: The text has been modified to incorporate applicable suggestions.

Comment: (Volume I, p. I-80, paragraph 4) The reclamation objective stated is too limited in scope. Reclamation objectives are to leave soil of such a quality that the land has the maximum number of alternative uses and the maximum productivity for priority uses, including the growth of plants necessary to maximize environmental quality after mining.

Response: The text has been revised in the FES.

Comment: (Volume I, p. I-85, paragraph 3) The listing of agencies should include the Soil Conservation Service.

Response: The Soil Conservation Service is not listed on this page because it does not have supervisory authority over the operations as do the other agencies listed.

Comment: (Volume I, page I-144, line 3) Change "these soils" to "the clayey soils of the area." Certainly all the soils aren't easily compacted and highly susceptible to shrink-swell.

Response: The statement questioned is a part of the generalized summary of anticipated management problems associated with soils of the Powder River Basin. Certainly, all soils of this area do not have the properties mentioned, however, the majority of soils of the area are fine families with montomorillontic minerology.

Comment: (Volume I, pages I-144 & 145) The discussion of the soil association map and its interpretations is interwoven with incorrect statements and indefinable negative implications, e.g., the fact that all data available, including that "dating back to 1953," was used in compiling the map is said to make its accuracy questionable. This factor does not affect the accuracy

of the map, as all data was interpreted using up-to-date standards. This statement, as it now appears in the text, is entirely false. Soil associations are not "grouping of soils," and the implications that emerge from this assumption are also erroneous.

Response: The statements on page I-144 and I-145 are appropriate regarding the soils portion of this report and the soil association map. The compilation of this data was done by the study team within the framework of this particular study. The "standard" format used by the USDA - Soil Conservation Service for "Generalized County Soil Maps" or "soil association maps" were not necessarily followed however, existing data collected by SCS was used in preparing the soil association map, descriptions and interpretations.

Comment: (Volume I, page I-268, paragraph 2) The reference to "zootic" climax should be deleted. This is a controversial concept and has no real bearing on the vegetation discussions that follow.

Response: The cycles of use by domestic livestock and wildlife have held the vegetation type in about the same stage of succession for many years. With animals being responsible for this stage it is termed "zootic".

Comment: (Volume I, page I-269, paragraphs 2 and 3) Here and through the entire statement the term "vegetative type" is used. The correct term is "vegetation type".

The specific name for tufted hairgrass is misspelled, it should be "caespitosa". Scientific name for bearded wheatgrass should be "Agropyron subsecundum".

Response: Vegetative type has been changed to vegetation type in the FES. Vegetation is the correct term.

Comment: (Volume I, page I-269 through I-277) Discussion of vegetation of the area under consideration does not make clear if present or potential

plant communities are being described. It would be better if both were described. SCS range site descriptions would be useful for this purpose. They would likewise be appropriate since most of the surface area in question is privately owned.

Response: This section is the description of the existing environment. The potential plants that could be used are listed in the site specific mitigating measures, the plants and plant community selected will depend on the desired land use objective.

Comment: (Volume II, pages I-475 to I-478) This entire section is apparently written with the underlying assumption that the A horizon and portions of B and C horizons favorable for plant growth (topsoil) will not be graded over the spoil. Yet earlier portions (e.g., page I-61) assume that it will be replaced. Thus the section should be redone to be consistent, and should assume that "topsoil" will be replaced. Many changes are required if this is to be done.

Response: This section is an identification of impacts. Mitigating measures with regard to this question can be found in the individual site specific mitigating measures sections.

Comment: (Volume II, page I-545) Should the Annual Livestock Forage Lost be AUMs, not acres/AUM.

Response: Evidently the page citation is in error, however, it is true that the annual livestock forage lost should be expressed as AUMs and not Acres/AUM. If reference is being made to Table 14 (page 544), the acres/AUM is a part of the heading description of the precipitation zones which gives the assumed average carrying capacity for each zone in acres/AUM. The annual livestock forage measurements are contained under the dominant column heading.

Comment: (Volume II, page I-627, paragraph 2) This is written with the apparent underlying assumption that topsoil will not be graded over the surface. Thus, it is inconsistent with earlier stated assumptions.

Response: A portion of this section has been deleted from the text. The discussion of spoils, however, needs to be presented because they will be exposed for varying lengths of time until rehabilitation is completed and some exposure of spoil material is anticipated to occur through erosion after rehabilitation. The underlying spoils are also anticipated to be quite near the surface as the topsoil available for coverage is limited.

Comment: (Volume II, pages I-629 to I-633) SCS experience and technical guides are not mentioned in relation to revegetation. It appears that such expertise and information could be cited here.

Response: Agreed some of the material contained in this part was obtained from SCS information. The citation was inadvertently left out.

Comment: (Volume II, page I-630) The statement about topsoil being loose, friable, and susceptible to erosion is too broad. It may be, depending on its texture, organic content and grading methods.

There are many cases where mulches are highly effective where annual precipitation is much more than 14". The essential point is that there may be no prospect of obtaining satisfactory vegetation where precipitation is less than 14 inches without using mulches.

Response: The statement as contained in the text is generally true, however, the relativity of this would depend on the texture, organic content and grading methods.

It is agreed that mulches are also highly effective in higher precipitation zones. Emphasis was added to this precipitation zone, in the document, since this is a characteristic of much of the region and is as cited by the National Academy of Science.

Comment: (Volume II, page I-633) Maintaining vegetation does not depend on soil development. It depends upon the properties of the soil left at the surface, especially its pH, salt content, and ability to supply available water and plant nutrients. Applying manure, etc., will enhance or improve the soil's capacity to supply plants with water and nutrients. Over a period of ten thousand years it will no doubt influence the formation of the soil.

Response: It is agreed that the soil forming process requires a considerable length of time and as presented does not lead to this impression. The appropriate text change has been made in the FES.

Comment: (Volume II, page I-651, paragraph 2) Assuming that topsoil is graded back over the spoil, the new soil will not be "totally unlike" the soil before mining. It should have a number of important similarities, and its best management expected performance will be similar in many respects to the original soil. This is, in fact, one of the vital advantages of replacing the topsoil, in that existing knowledge about specific soils and kinds of plants adapted to them can be applied in revegetation practices with good prospects for success.

Response: From a pedogenic standpoint, the new soils will essentially be Entisols prepared from Ustollic Haplargids for example. The intent here is to indicate a change in pedogenic character of the soils disturbed by mining. There is a possibility that the new soils may have a higher management capability than the natural soils.

Comment: (Volume II, page I-655, paragraph 3) It is incorrect to say that "plant succession will be destroyed". It will be interrupted or caused to change direction due to the severity of the disturbance. It is also faulty to predict that vegetation will return to present state in 50 or more years. Due

to the severity of the disturbance, the original plant community may never return. A new site is created and therefore, a new "climax" vegetation.

Response: If the area is mined the existing vegetation will be destroyed, the area will then be reclaimed, and plant succession will start again.

Comment: (Volume II, page I-862) The "better soils" will be stockpiled and graded back over the surface, according to earlier assumptions (page I-61). Thus, this paragraph isn't consistent with the rest of the report. The greatest loss will be soils on which the facilities are built. Even though the topsoil is graded over the final spoil, there will be a loss of soil micro-organisms and plant seeds in the surface soil and a loss of the natural soil structure.

Response: This statement indicates that, no matter what mitigating measures are employed, some loss in quality can be expected through mixing and burying of soil materials.

Comment: It would be desirable to include in Volume III, page II-91, some reference to stockpiling the organically enriched A horizons from the area to be covered by the railroad, and that from adjacent cuts or below adjacent fills, for use in blanketing the cuts, fills, and other disturbed areas after construction is completed.

There would be little need to stockpile material from the B horizons to grade over the cuts and fills as much of the material exposed thereon would be from B horizons. Thus, the appropriate definition of "topsoil" used in relation to the railroad construction should include only the A horizons of the natural soils, whereas, "topsoil" for use with surface mining should include the A horizon and those portions of the B and C horizons that are favorable for plant growth. A tightening-up of these definitions is badly needed in this EIS.

Response: Mitigating measures (page II-131) will require the stockpiling of topsoil for later replacement on disturbed areas. A definition for topsoil has been added to the glossary (Volume V).

Comment: (Volume III, pages III-68 to III-75) The "ecosystems" described here read much like range sites. It would seem appropriate to use SCS range site descriptions for this and similar sections since a very high percentage of the surface acreage is privately owned and all which are under district agreement probably have range site and condition inventories already.

Response: Due to the large acreage involved, we contacted the SCS for the ranches under district agreement and found that only a part of the area was under agreement. The above referenced lease site is over 50% federal surface.

Comment: (Volume III, page III-145, paragraph 2) Same comment as that for page I-651, paragraph 3 -- unsuitable for what? The intended meaning needs to be clarified.

Response: This is in error, and has been changed to unavoidable in the FES.

Comment: For Volume IV, page IV-42, paragraph 1, the same comments as for page III-31 apply here, after the first sentence.

Paragraph 2 -- the statement "Although each of these mapping units was not studied nor mapped individually in 1939" is incorrect and should be deleted.

Response: Paragraph 2, Volume IV, page IV-42 has been deleted in the FES.

Comment: The last statement (Volume IV, page IV-46) seems to imply that there is little suited topsoil for disturbed areas. Yet the Renohill, Terry, Satanta, and Ulm soils appear to have reasonably good suitability and cover a total of about 60% of the site. We do not want to discourage topsoiling by statements such as the last one when such suitability actually exists on much of the site.

We also note that the Bankard, Satanta, and Terry soils which occur on the site according to Figure 2, page IV-44, are not interpreted in Table 1, p. IV-43.

Response: The statement has been revised to remove "topsoil for disturbed areas". Interpretations for the three soils omitted from Table 1 are included in Volume V, Appendix C, pages C-28 and C-33.

Comment: (Volume IV, page IV-120, third paragraph) The acreages that will be permanently lost from forage production is given as 240 or 740. This does not agree with page IV-108 that indicates 605 acres of vegetation will be permanently lost.

Response: All areas that are revegetated (p. IV-108) are not returned to livestock production. In this case the road relocation and spur rail line right-of-way would be fenced and not available for livestock forage.

Comment: (Volume IV, page VI-4, last paragraph) Surface and coal ownership acreage figures given here do not agree with acreages discussed in succeeding sections.

Response: The acreage figures shown on this page were in error and have been corrected.

Comment: (Volume IV, page VI-89) Discussion does not make clear how much land will be permanently removed from grazing use.

Response: Appropriate text changes have been made.

Comment: Volume IV, pages VI-122 and VI-127) On page VI-122 it states 1,125 acres of vegetation will be permanently removed while on page VI-127 it states that 900 acres will be permanently removed from grazing. If this discrepancy is real, it should be explained.

Response: This discrepancy has been noted and appropriate text changes made.

Comment: (page I-329, third paragraph) In the second sentence, the term ". . . large. . ." as a qualification for black-footed ferret habitat, needs quantification.

Response: We concur that the term "large" is a relative term. At present, detailed inventories describing the extent of prairie dog populations in the study area, are unavailable. This fact dictated the generality of the text regarding prairie dogs.

Comment: (Page III-124) In the second sentence, eliminate". . . with no slopes greater than 3:1". Such a decision has not been made in the A.R.Co. lease.

Replace the first sentence of the second paragraph with "The final land form and use will be determined by the individuals or agencies with jurisdiction and responsibility for surface management". Eliminate the second sentence.

Response: The text has been modified to incorporate the changes in reclamation plans as submitted by Atlantic Richfield Company.

Comment: (Pages III-127 and V-125) A potential adverse effect is the loss of well water supplies when dewatering for mining. The only mitigation measure mentioned is replacement with water from deeper wells. Is this the only one available?

Response: Other mitigating measures have been added to the final statement.

Comment: (Page III-138, paragraph 4) This sentence should read ". . . coordinated by the surface owner or agency administering surface values with the Wyoming Game and Fish Department".

Response: The text has been revised.

Comment: (Page V-123) Soil information required of Kerr-McGee prior to mining is incompletely listed. It should include chemical analysis and otherwise

be identical to that being required of the Atlantic Richfield Company (A.R.Co.) Site in III-125.

Response: The requirements are the same. Corrections have been made.

Comment: Page V - Map 1: The colors in both the legend and on the map of the National Grassland appear to be mixed up. There are a number of obvious errors and inconsistencies in the maps. Greater care in their preparation can eliminate most of the problems -- for example, on Map 9, surely the summer range for antelope is not limited (as shown) to less than a township in this study area of approximately 5 million acres.

Response: This has been corrected in the final EIS.

57. Department of Agriculture, Economic Research Division

The major comments requiring responses have been previously answered, mainly under the general and hearing comment sections.

58. Department of Commerce, Science and Technology

The comment raised by this letter was previously answered under letter number 55.

Letter comments 59-64 were received subsequent to August 16, 1974, which was two weeks after the closing date for comments of August 2, 1974. Due to a printing contract and personnel commitments to other work items, adequate time was not available to respond fully to these comments or make all of the technical changes suggested. Most comments which would have received a response if they had been timely submitted have been addressed previously in this volume. Also, these comments will be fully utilized if the regional portion of the statement is supplemented or revised to reflect later acquired data and other subsequent change.

With respect to the comments of AMAX Coal Company, AMAX submitted comments on July 31, 1974, but subsequently withdrew those comments and submitted the comments reproduced in this statement. The withdrawn comments and associated correspondence are available to the public at the office of the State Director, Bureau of Land Management, Cheyenne, Wyoming.

With respect to the comments received from the Sierra Club, Northern Great Plains office on August 28, 1974, consideration of the alternative of constructing the railroad only from the mines to Gillette has been included in Part II of the DES. A grade greater than 1 percent was considered during the planning of the statement and was rejected as not constituting a reasonable alternative.

The 1.0 percent grade maximum against loads for the proposed rail line is not unique and in fact conforms to gradient maximum throughout substantially all of the Burlington Northern's rail system. There are certain areas where this maximum is currently exceeded. For example, in the Rocky Mountains at Bozeman Pass, Blossburg, and Summit, Montana and in the Cascade Mountains at Stampede Pass and Scenic, Washington, the maximum grades range from 1.0 to 2.2 percent. East of Billings and Shelby, Montana, there are similarly points which exceed the 1.0 percent maximum; the most notable of which is at Crawford, Nebraska, where a maximum of 1.55 percent is encountered. These instances, however, are the

exception rather than the norm and are generally limited to mountainous terrain. With the exception of relatively few mountainous areas all other Burlington Northern trackage in North Dakota, Minnesota, Iowa, Nebraska, Texas, Missouri, and Illinois does not exceed the 1.0 grade maximum.

Where a 1.0 percent sustained grade is exceeded, certain constraints are imposed on efficient rail operations. Two additional power units are required to pull a unit coal train over a 1.5 as opposed to a 1.0 percent maximum. The higher grade also necessitates use of radio control operations, increases fuel and lubricant useage, requires more maintenance on more power units, and raises crew wages, which are based upon locomotive weight. Because of these factors and more, the Burlington Northern is considering a design criteria over its entire system at the 1.0 percent maximum for coal traffic. Where feasible, reducing existing excessive grades, such as those at Crawford, is being considered.

For efficient rail operation, the number of power units per unit train equates the number required to handle the highest sustained grade over the entire shipment. Traffic generated on the proposed line directed south through Douglas and then to consumptive points in Nebraska, Iowa, and Illinois would encounter no grades greater than the 1.0 maximum. Should the proposed route be designed for a higher maximum, additional power units would be necessary for the relatively short haul to Douglas, but would most likely be retained to at least Alliance, Nebraska. This would increase investment and fuel consumption expenses.

During the planning of the statement, the rail connection between Gillette and Douglas was viewed in relationship to the total rail network over which projected coal traffic would travel. Because of the general 1.0 percent maximum grade over connection trackage, a higher grade over the proposed route was considered incompatible with current and projected coal train operation and was considered as to not constitute a reasonable alternative.

ACTUAL WRITTEN COMMENTS
IN CHRONOLOGICAL ORDER

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5	Homer A. Robinson	VII-297
6	Central Louisiana Electric Company	VII-298
7	Thomas E. Horobik	VII-300
8	U.S. Dept. of Agriculture, Rocky Mountain Forest & Range Experiment Station	VII-304
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10	Barbara Gilfillan	VII-309
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12	Getty Oil Company	VII-311
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14	John E. Mooney	VII-314
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16	Panhandle Eastern Pipe Line Company	VII-318
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21	Oklahoma Gas & Electric Company	VII-333
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29	University of Wyoming, Dept. of Geology	VII-363
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OFFICE OF
COUNTY CLERK
EX-OFFICIO REGISTER OF DEEDS
NIOBRARA COUNTY
LUSK, WYOMING 82225

June 4, 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

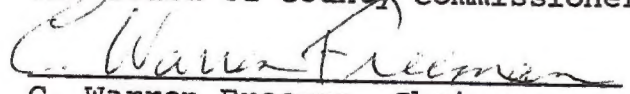
Dear Sir:

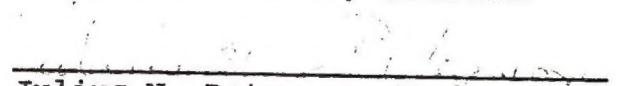
To the best of our knowledge we have no use for the box of books. There is no way we can take the time to read all the books and at the same time take care of the County business.

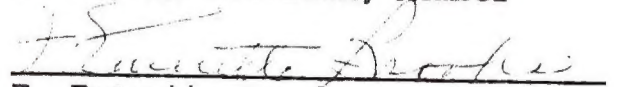
So to get a comment back to you before July 18, 1974 would be impossible. Please pass these books on to somebody else who has nothing to do, maybe they can take time to read them.

Sincerely,

The Board of County Commissioners


C. Warren Freeman, Chairman


Julius N. Peterson, Member


F. Everette Brooks, Member

bfm

GEOTHERMAL ENERGY INSTITUTE
680 BEACH STREET, SUITE 426
SAN FRANCISCO, CALIFORNIA 94109
(415) 474-0404

June 15, 1974

Mr. Daniel P. Baker, State Director
U. S. Bureau of Reclamation
State Office
P. O. Box 1828
Cheyenne, Wyoming 82001

RE: Draft Environmental Impact Statement covering a regional
analysis of the proposed development of coal resources
in the Eastern Powder River Coal Basin of Wyoming, dated
May 31, 1974

Dear Mr. Baker:

We have reviewed and wish to submit comments upon this
DES for your consideration:

1. The heart of an environmental impact statement is not,
as most people believe, the analysis of the impact of the proposed program.

Rather, the heart of an environmental impact statement
is the consideration of alternatives to the proposed program and the
respective environmental effects of those alternatives.

The DES is not meant to be a document which sets out
to defend and justify the program under consideration but is meant to
facilitate the weighing and balancing of the costs and benefits of alternative
programs. Calvert Cliffs' Coordinating Committee v. AEC, 449 F. 2d 1109, 1128
(D.C. Cir. 1971).

Section 102(2)(c) of NEPA specifically requires a
thoroughgoing assessment of alternatives to the proposed action. This has
been said to be "particularly critical because it is usually through this
medium that mitigation measures may be discovered." Sierra Club v. Froehlke,
359 F. Supp. 1289, 1343 (S.D. TEX. 1973).

Indeed, the alternative assessment requirement has been
characterized as "the linchpin of the entire impact statement". Monroe Co.
Conservation Council v. Volpe, 472 F. 2d 693, 697-98 (2d Cir. 1972).

A summary of program alternatives and their assessment
should be included in the Introduction of the DES.

2. It is entirely inaccurate to say that "Geothermal
resources that can be commercially exploited in the U.S. at present are
limited to one area, The Geysers, California". (p. I-817).

Geothermal reservoirs are being exploited for space
heating, domestic water heating and for a variety of agricultural, ranching
and recreational purposes in a number of areas in the West such as Klamath
Falls, Oregon where some 400 operating geothermal wells are in use.

We note that less fuel is used for transportation than is
used for the operation of building services (space heating, hot water
heating, airconditioning, illumination, etc). Office of the Chief Engineer, 1974,

A Technical Basis for Energy Conservation: Federal Power Commission, p. 5.

In addition, Union Oil Company has announced the establishment of a commercial reservoir at the Valles Caldera in New Mexico and at least 100 exploration companies and partnerships are out actively exploring geothermal reservoirs in 11 Western States. The U. S. Bureau of Reclamation itself is developing the East Mesa Anomaly in the Imperial Valley of California and it's activities has attracted commercial interest.

The U. S. Bureau of Land Management can furnish you with the details of the Federal Geothermal Leasing Program and the activities occurring in the Wyoming region.

The Yellowstone National Park and surrounding area of Wyoming is one of the world's best known and studied geothermal reservoirs. We are of the opinion that even the resources within the Park itself can be developed in small amounts in remote areas to replace the fossil fuels that are combusted in the Park for space heating etc.

The U. S. Geological Survey has identified at least 824,000 acres in Wyoming as having geothermal potential (U.S.G.S. Circular 647, 1971) and we note that expert exploration interests have applied for Federal geothermal leases in the State.

3. The geothermal potential of The Geysers is estimated at 5,000 - 8,000 MW by Dr. Giancarlo Facca, a recognized geothermal authority and contrasts with the 1300-2000 MW figure usually given for the present area in production.

4. PG&E has moved to a 140 MW turbine-generator set for future installation in place of 55 MW sets.

5. The number of wells needed to supply a plant varies with the amount of steam from a given well. Wells now are drilled which produce over 300,000 lbs/hr. Three such wells can drive a 55 MW geothermal power plant.

6. We disagree with the undocumented opinion at page I-817 that unspecified "technical and economic constraints" will permit geothermal energy to constitute a major energy source.

Our detailed economic analysis show that geothermal energy is the cheapest energy source in California and that it can compete very successfully with any other energy source in any Western State.

This analysis also ignores the proven technology for wet steam systems which exists in Mexico, New Zealand, Iceland, Japan, U.S.S.R. and Iceland. The Phillipines and El Salvador which also have similar systems. Why not the United States?

7. The DES is seriously inadequate in failing to assess the environmental impacts of different fuel cycles. Such a comparison, we submit, favors geothermal cycles over nuclear and fossil fuel cycles. We are enclosing a copy of Bowen's analysis in this regard for your information.

8. We note that geothermal 'blow-outs' have been extremely rare and are avoidable events in light of modern-day technology.

9. We note that the DES correctly observes that "Planned coal developments require larger and more dependable water supplies than are presently developed in the study area". (P. I-489). This Section of the DES, however, does not document the calculations of annual water requirements

GEOTHERMAL ENERGY INSTITUTE

at pages I-486/7 for review.

We note that geothermal aquifers will provide new deeper sources of water and that geothermal power plants such as exist at The Geysers do not require a fresh water supply since steam condensate provides a water supply.

10. We are of the opinion that the environmental analysis of air quality impact from coal power plants is inadequate in that it fails to assess the impact of radionuclide emissions produced by coal combustion. See generally, American Public Health Association, 1974, Health and Safety Effects of Energy Systems.

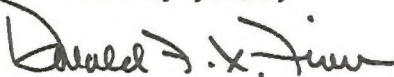
11. May we refer you generally to H.C.H. Armstead, 1973, Geothermal Energy: UNESCO, Paris, France for a recent expert assessment of geothermal exploration and utilization techniques.

12. Finally, we believe that the discussion of the uranium resource base is inadequate. It does not sufficiently make clear that reserve figures include speculative estimates of reserves. P. I-808.

As of March 5, 1974 the AEC admitted that uranium production capability from "known reserves" could be less than annual requirements by 1985. F. B. Baranowski, 1973, Statement on Uranium Resources; U.S. Atomic Energy Commission. See also AEC, 1973, Nuclear Fuel Supply: WASH-1242- "presently known domestic (uranium) resources and existing production capacity are inadequate to meet the corresponding uranium demand"; AEC, 1974, WASH-1535- "ore reserves are far less than forecast requirements to meet the corresponding uranium demand."

We appreciate the opportunity to make these comments. Please let us know if we can furnish any further specific information on geothermal energy from our extensive files and library.

Sincerely yours,



Donald F.X. Finn
Managing Director

dfxf:CC

Enclosures (2).

MIDDLE SOUTH UTILITIES, INC./280 PARK AVENUE/NEW YORK, NY 10017/(212) 687-7181

FLOYD W. LEWIS
PRESIDENT/CHIEF EXECUTIVE

June 25, 1974

State Director
Bureau of Land Management
Department of the Interior
2120 Capital Avenue
Cheyenne, Wyoming 82001

Subject: Comments of Middle South Utilities, Inc. on the Mining of Coal
in the Powder River Basin, Wyoming

Dear Sir:

These comments are submitted on behalf of Arkansas Power & Light Company, Arkansas-Missouri Power Company, Louisiana Power & Light Company, Mississippi Power & Light Company and New Orleans Public Service Inc., which are electric utility operating companies composing the Middle South Utilities System, and System Fuels, Inc. System Fuels, Inc. is a subsidiary of four of the operating companies and is charged with the responsibility for acquiring and providing to the System companies fuels for their generating plants. The System is directly responsible for electric service to more than 1,317,000 retail customers and to a number of municipal electric systems and rural electric cooperatives in a 92,000 square mile area within Arkansas, Louisiana, Mississippi and southeast Missouri.

Inasmuch as the Middle South Utilities System now burns no coal in its electric generating plants, some brief background should help to understand our keen interest in the subject of coal mining in the state of Wyoming. Located in a major gas-producing area, natural gas has been the area's historic fuel, available in ample quantity and at reasonable prices. Consequently, all of our 51 presently operating major generating units were designed to operate on natural gas as their primary fuel. As a matter of fact, by providing a sizeable year-round, and particularly summertime, market for natural gas, electric generating plants made an important contribution to the development of the natural gas industry in the United States.

In recent years, however, our System companies have experienced increasingly severe curtailments of contracted-for natural gas deliveries pursuant to Federal Power Commission established priorities for end-use of interstate natural gas, which give boiler fuel a very low priority. This policy has had the effect of denying our System full use of the area's fuel sources in order to conserve this fuel, natural gas, for use throughout the nation in other applications for which there are more limited substitutes presently available. As a consequence, our System has been forced to rely increasingly heavily on oil as a generating fuel. In 1970, we utilized one million barrels of oil; in 1971, 3.6 million; in 1972, 6.7 million; and in 1973, 13 million. We estimate our fuel oil requirements in 1974 to be 22 million barrels, almost all of it to replace curtailed natural gas.

As the Bureau of Land Management is certainly well aware, fuel oil also has been in short supply and escalating in cost. To date, our System has been able to acquire the needed fuel oil to supplement reduced natural gas deliveries, and we have had no major disruption or interruption of electric service to our customers. However, as fuel costs have dramatically increased, our customers have felt the impact of these higher costs through the operation of the fuel adjustment clauses in our rate schedules.

During the mid-1960's, several years before we experienced any actual curtailment of natural gas deliveries, the management of our System recognized the need to diversify our generating fuel base to insure a reliable supply of electric energy. Events of the last year or so have made clear the need to develop domestic fuel sources that minimize the costs to our customers and to lessen our dependence on imports of fuels from foreign sources. In 1967, we took the first step to diversify our generating fuel base with the announcement of plans to construct the first nuclear-fueled generating unit on the System - an 850,000 kilowatt unit located in central Arkansas. Incidentally, this was the first nuclear-fueled generating unit in our part of the nation where natural gas was the historic generating fuel. Loading of the first fuel core into this unit was completed early in June. It should go critical by the end of June, and is expected to be in commercial production about October 1 of this year. Our second nuclear unit is now about 30% complete and should be in commercial operation in 1977. We have announced five other nuclear units which are in various stages of contracting, licensing and construction, and are scheduled for operation by 1985. These seven nuclear units will have an aggregate capacity of 7,900,000 kilowatts, and in 1985, will be about 30% of our total generating capacity.

In further diversifying our fuel base, we have under construction three major generating units which are designed to use heavy fuel oil as their primary fuel. The first of these will be in operation this summer with the other two due to be finished in 1975.

Our most recent move in diversifying our fuel base, and also making use of our domestic fuel resources, was the announcement last year of our intention to build a large coal-fueled plant in central Arkansas. The proposed plant will have four units, each with 700,000 kilowatt capacity, scheduled for operation in the 1978-1981 period. To help in making this plant environmentally compatible, Arkansas Power & Light Company has contracted for low sulfur coal from Wyoming, one-half of which will be supplied by Kerr-McGee from a new mine in the Powder River Basin, one of those under consideration in the Bureau of Land Management hearings.

Moreover, the Middle South Utilities System is dedicated to providing for minimum and acceptable environmental effect, not only in the generation of electricity within its service area, but within the entire energy supply system. To that end, our coal supply contracts include all costs necessary to insure reasonable and adequate restoration of any areas which are strip mined to provide fuel for our plants.

We anticipate that by 1985, the Middle South Utilities System will have a total of about 4,900,000 kilowatts of coal-fueled generating capacity installed at various

State Director - Bureau of Land Management
Department of the Interior
June 25, 1974 - Page 3

3

locations within our service area. When this construction program is completed in 1985, our System will have been moved from 100% dependence on gas and oil to a diversified fuel mix with nuclear and coal, our most abundant domestic energy resources, accounting for the majority of the base load fuel.

I would like to emphasize that our studies of customer requirements indicate that the timely addition of this capacity is essential. We believe that electricity, now providing approximately 26% of our nation's total energy requirements, will be called upon for an increasingly larger proportion of total energy; and that the additional electricity will have to be produced primarily from coal and nuclear fuels.

Our consideration of our nation's energy supply problem has led us to the conclusion that there is no single solution. However, it seems very clear that if our nation is going to achieve a capability for energy self-sufficiency, coal - particularly low sulfur Western coal - will unquestionably have to be called on to fill a substantial part of the near and medium-term energy supply gap. We believe that this is generally agreed to by almost all the authorities who have studied the subject; and such increased use of coal must occur on practically a nationwide basis.

We have not reviewed the draft environmental statement for the development of coal resources in the Eastern Powder River Basin of Wyoming. However, we strongly believe that the Kerr-McGee mine which would provide coal to our System from Campbell County, Wyoming will be operated in an environmentally responsible manner, and we would insist that this be done. Furthermore, the facilities in which we will use this coal in Arkansas will be designed, constructed, operated and maintained so as to meet all applicable environmental regulations and standards and to be compatible with the area in which the plant will be located. It is our hope that transportation of the coal will be predominantly by slurry pipeline, which would have distinct environmental advantages.

We earnestly urge the Bureau of Land Management to give full consideration to the nation's need for Wyoming coal to meet its energy requirements and to take appropriate action to facilitate the mining of such coal, subject to all applicable environmental protection standards.

Communications regarding these comments should be sent to my attention at Middle South Services, Inc., Post Office Box 61000, New Orleans, Louisiana 70161.

Respectfully submitted,

MIDDLE SOUTH UTILITIES, INC.

By



Floyd W. Lewis
President/Chief Executive

The following statement expresses my own personal feelings and thoughts concerning the coal mining and industrial development of the Powder River Basin.

When it became apparent that coal mining was moving into our area, I, like many of my neighbors and other ranchers in the area were very resentful, due to rumors that our land would be condemned and taken at the assessed value. This, plus the fact that our sentimental values run very high for this land which our fathers and grandfathers had homesteaded and passed on to us, had left us rather bewildered and frustrated. After companies have come in and started purchasing this land at more reasonable figures, and in most cases, leasing back to the ranchers, the resentment has subsided. This, plus the fact that the coal is definitely needed for the national economy, my feelings are somewhat changed. I feel that with reasonable consideration among all parties involved, that there will be an orderly development of the coal resources.

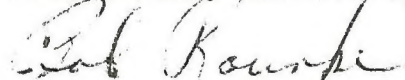
As the coal companies buy up this land, I feel that the surface should be leased back to the rancher so that individual ranching will continue in the area rather than corporation ranching and farming. This has been basically an agricultural community and when the mining operations are completed, will undoubtedly return to agriculture and individual operations would continue. Since not too much area would be opened at one time for mining, the ranching could continue on both the unmined and reclaimed areas, thereby maintaining a stable operation for the rancher and business community.

In preparing for the increased population in the area, I feel that the developing companies should notify local and state governments far enough in advance so that proper steps can be taken. In regard to financing the needed public and municipal facilities, plus the reclamation of the mined lands, there should be an added tax on the coal, paid by the consumer. I feel that the private property owners in the affected counties should not have to pay for this development.

Every effort will have to be made to protect our water resources, which is our most basic need and to reclaim the mined areas to at least its present producing levels.

In conclusion, as I have said before, that reasonable consideration among all parties involved will help to make this all worthwhile.

Respectfully submitted,



Bob Rourke

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Mr. Jesse R. Lowe
Acting State Director
Bureau of Land Management, State Office
P.O. Box 1828
Cheyenne, Wyoming 82001

June 28, 1974

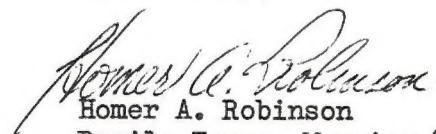
Dear Mr. Lowe:

I feel the draft enviornmental impact statement on coal development in the Eastern Powder River Coal Basin is critically incomplete. The statement indicates that coal is available in Colorado, Wyoming, Nebraska, Montana and North and South Dakota but does not indicate the amount of coal to be mined in those states. The statement leaves the impression that only Wyoming is to be mined.

In addition, the report does not speak to coal exports from the United States which amounts to about 53 million tons annually; more than the amount proposed to be mined in the Basin.

I feel the statement is really a justification of the easiest way to increase energy production in the U.S. And this "easiest way" is nothing less than a rip-off of Wyoming.

Yours truly,


Homer A. Robinson
Devils Tower, Wyoming 82714

6



P. O. BOX 111

ALEXANDRIA, LOUISIANA 71301

June 28, 1974

R. E. CHAPPUIS
EXECUTIVE VICE PRESIDENT

State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

From 1938 to 1969 Central Louisiana Electric Company, Inc. enjoyed the favorable position of an abundance of natural gas in proximity of its electric generating stations which we purchased as a fuel to satisfy the electric energy demand of 139,000 customers served by the Company in 31 parishes of the State of Louisiana.

With the greater portion of gas produced in our state going to interstate pipe lines to the advantage of customers in other states, and with the diminishing gas reserves and discoveries available to our Company as a fuel supply to produce electricity, we contracted on June 29, 1973, to purchase 50 million tons of low-sulfur coal from Kerr-McGee Coal Corporation. This coal will be mined from reserves in their Jacobs Ranch Mine, Campbell County, East Gillette, Wyoming, to be delivered beginning in 1978 to CLECO's Units Two (2) and Three (3) at Rodemacher Electric Generating Station, Boyce, Louisiana. Unit Two is scheduled for commercial operation on January 1, 1979, followed by Unit Three in 1981. Major equipment has been purchased for Unit Two, and work is proceeding in the engineering, designing and purchasing phases as this additional generating capacity is absolutely necessary to meet system customer demands in 1979.

Of the total installed capacity in two of CLECO's power stations, the Company has converted from natural gas to light (No. 2) oil burning all of its presently installed boilers which are capable of burning light oil for limited periods of time when gas is in short supply, or under curtailment procedures of the gas supplier. The

third power station's Unit No. One boiler, scheduled for operation on January 1, 1975, has been designed to burn heavy oil continuously.

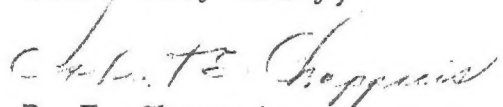
Oil storage facilities are being constructed at all three stations.

The Company is aggressively attempting to contract for fuel oil supplies. To date we have potential suppliers for 50 percent of the loading requirements of our Unit One, Rodemacher Station. The remainder of fuel required for this unit will be supplied by the gas company. Spot purchases of light oil have been available for the remaining boilers, as stated above, when gas is curtailed.

Our supplier of natural gas, Louisiana Intrastate Gas Corporation, a wholly owned subsidiary of Central Louisiana Electric Company, Inc., has made projections of available future boiler supplies and indicates serious deficiencies for all years after 1975.

We, therefore, urgently need a low-sulfur coal supply for the generating units referred to above.

Yours very truly,


R. E. Chappuis

REC/gt

cc: B. J. Guillory
J. T. Simms, Jr.
W. J. Watts

State Director
Bureau of Land Management
P.O. Box 1828
Cheyenne, Wyoming 82001

June 29, 1974

Dear Sir;

The following series of quotations is taken from the draft environmental impact statement pertaining to Development of coal resources in the eastern Powder River coal basin. Please include this statement in the official record.

- 1) "The probability of a two-day inversion occurring is 15 times per year and a five-day inversion could occur four times per year. During these periods, significant short-term effects (to humans, animals, vegetation) may occur"
- 2) "Total avoidable stack emissions by 1990:
 - a) particulates - 24,360 tons/year
 - b) sulfur dioxide - 78,480 tons/year
 - c) nitrogen oxide - 73,480 tons/year
 - d) carbon dioxide - 12,000,000 tons/year
- 3) "Long-term unavoidable damage to plants, animals and humans may occur and be unavoidable from the effects of air pollutants added by the development and utilization of coal in the study area (Campbell and Converse Counties)."
- 4) "Destruction of natural features of the landscape is unavoidable."
- 5) "Disturbance of topsoil on approximately 29,000 acres by 1990 cannot be avoided."
- 6) "On the area to be stripmined (14,000 acres by 1990) complete destruction of all soil horizons, parent material and soil characteristics which have developed over long periods of geologic time cannot be avoided."
- 7) "As an end result of mining, new soils will be formed with characteristics totally unlike the ones existing prior to mining, and, during their early geologic life, likely less suitable as substitutes for vegetation growth."
- 8) "Reduction of soil productivity, permeability and infiltration rates are unavoidable."
- 9) "~~REMARKS~~ Increase in erosion and sedimentation rates will occur but the amount of soil loss through time cannot be determined."
- 10) "The increased use and consumption of water (40,600 acre-feet per year) in the study area (two counties) by 1990 cannot be avoided."
- 11) "The exact amount (water) which will be consumed and available for other use is indeterminable and unavoidable."
- 12) "The removal from the study area hydrologic cycle of an estimated 15,000 acre-feet/year by 1990 in the coal slurry pipeline cannot be avoided."
- 13) "The adverse impact resulting from the interruption of aquifers during mining cannot be avoided."

- 14) "Lowering of water levels of wells and drying up of springs, seeps, and reduction of streamflow will occur in an area around the mine when aquifers are disrupted."
- 15) "Increasing use of ground water as proposed may affect water well levels and discharge of ground water to streamflow."
- 16) "Changes in water use from agricultural and irrigation uses will occur. These changes although involving water uses, will actually have adverse, unavoidable impact on farming, grazing and recreation land use as well as on fish and wildlife populations."
- 17) "Reduction in water quality resulting from increased erosion, sedimentation, overtaxed sewage facilities, release of toxic waste to streams, and return of production water to stream channels will take place. The overall reduction in water quality which will take place is unknown."
- 18) "Existing vegetation will be destroyed on the mined areas, plant sites, housing sites for increased population, transmission line and pipeline rights-of-way, roads and railroad rights-of-way."
- 19) "With the semi-arid climate prevalent for the study area, successful revegetation on severely disturbed mined areas is unknown at this time."
- 20) "All plant succession is unavoidably destroyed at the time of disturbance. Fifty years or more of plant succession will be required for these areas to return to their present state as the existing soil structure and microclimate have been changed and altered."
- 21) "Adverse impact of stack emissions, especially sulfur dioxide, on vegetation is unknown. The impact particularly on Ponderosa pine will be unavoidable."
- 22) "Increased access will increase the use pressure on all historical sites and could result in unavoidable damage."
- 23) "The change in scenic characteristics throughout the study area cannot be avoided."
- 24) "The change of the study area from a quiet rural setting, with wide open spaces, basically uninhabited, to a basin busy with industry and human activity is unavoidable. The quiet solitude and natural peacefulness of the area will be changed."
- 25) "Loss of habitat and reduction in populations will occur as a result of coal mining and utilization operations will be unavoidable."
- 26) "By 1990 it is estimated that 9,500 acres of habitat will be permanently destroyed, long-term productivity reduced on 19,500 acres, and 116,000 acres impaired by increased human utilization."
- 27) "The increased population in the basin will intensify recreation demand. The increased demand could cause deterioration and overuse throughout the area and on existing facilities."
- 28) "The generally unavoidable adverse effect is the lowering of recreation quality within the study and adjacent area."
- 29) "The permanent cumulative loss of 9,500 acres of agricultural land is unavoidable."
- 30) "The loss of agricultural production during periods of mining, construction, and rehabilitation cannot be avoided."
- 31) "Increased vandalism of livestock watering facilities and fences cannot be avoided."
- 32) "Separation and alteration of ranching operations will occur. Drying up of livestock water sources will occur, and ranchers will be INCONVENIENCED by changes in access patterns and use patterns."

page 3

- 33) "Increased mortality and molestation of cattle and sheep will take place."
- 34) "Irrigated cropland will be lost due to water right conversion. Total acreage lost due to lack of water is 31,473 acres by 1990."
- 35) "The labor loss from agriculture will likely be long-term, and it may never regain its former employment stature."
- 36) "Industrial development will induce new population that will demand housing. Regional population in 1980 will demand about 46,400 housing units, nearly 9,000 housing units more than the 1970 existing regional stock."
- 37) "As housing probably will not be immediately available, the adverse impact of incoming population having to accept inferior quality housing cannot be avoided."
- 38) "Public school districts, especially in Campbell and Converse Counties, would realize unavoidable increases in student enrollments, which in turn would impact existing school enrollment capacities and full-time teaching staffs. By 1990 Campbell County is projected to have an 8,360 pupil enrollment over present capacity and a full-time teacher deficit of 426."
- 39) "There will not be enough physicians, dentists, professional nurses, and other social workers to meet the demand. Quality of health care would be adversely reduced."
- 40) "Public health and safety hazards may increase, affecting the entire regional population."
- 41) "With or without increases in law enforcement personnel, crime incidence will most likely rise. If adequate levels of enforcement are not provided, intolerable conditions could be encountered in some areas."
- 42) "Unless expansion is undertaken by communities, deficiencies in water pumping capacity will have the unavoidable effect of diminishing a ~~XXXXXXX~~ community's ability to adequately meet hazardous fire conditions."
- 43) "Water treatment facilities will unavoidably be unable to meet the projected demand."
- 44) "Adverse unavoidable impacts could occur (use of low-quality water, increased sickness, poor health) from not providing adequate water treatment and distribution systems."
- 45) "Emissions could have injurious and toxic effects on humans working or living in the vicinity of power and gasification plants."
- 46) "Removal of overburden could result in bringing to the surface elements, such as boron, which may be toxic to plant growth."
- 47) "Wind action will cause fine soil, silt and clay particles to be lifted into the atmosphere reducing air quality and adding to soil loss."
- 48) "Even though land is reclaimed, soil will be lost. As this loss will take place in probably the most productive area of the Eastern Powder River Coal Basin, the loss could be significant."
- 49) "In order to fulfill this (water) requirement, additional ground and surface water supplies may be developed. Existing water uses may be changed or water may be imported from other basins."
- 50) "Changes in the present surface water use of northeastern Wyoming could have significant effects on agriculture."
- 51) "Industrial companies have already purchased over 12,000 acres of irrigated lands with the intent of having rights changed to industrial use. Requests have been filed with the State Engineer for changes involving one million acre-feet of water."

pages 4

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- 52) "Concern for possible offsite long-term fish and wildlife reductions or changes through habitat impacts as a result of industry use proposals cannot be overemphasized."
- 53) "Increased use of recreation resources outside the study area could result in the lowering of recreation quality in an ever-widening circle."
- 54) "The loss of each water source could affect the usability of several square miles of rangeland."
- 55) "Predator-prey interaction will be disturbed, causing buildups of predators such as coyote."

Remember, these are all quotations!!!

At least 50 of these 55 adverse impacts are unavoidable if the scheduled development takes place. It must further be noted that while coal development will bring money into the counties and the state, each of the above-listed impacts (along with many others not listed) will cost the same areas in dollars. Few if any of these impacts show up in the statistics or economists reports, however.

Wake up Wyoming! The state is being sold to the highest bidder and every resident in the state is a loser. The only money-makers in this deal is the government (federal) and multi-millionaire businessmen. No one in Wyoming (or Montana either) stands to gain anything. The price is too high!! If the above are unavoidable parts of development, who needs development? The development of this coal field must be controlled or stopped BEFORE it begins. Afterwards will be too late: they'll give back what's left of Wyoming but it will never again be Wyoming!

Sincerely,



Thomas F. Horobik

8

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Rocky Mountain Forest and Range Experiment Station
240 West Prospect Street
Fort Collins, Colorado 80521

8400
July 3, 1974

Mr. Dan Baker
State Director, Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001



Dear Mr. Baker:

We wish to compliment you on the Draft Environmental Impact Statement for the Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming. The five volumes contain an immense amount of data and a wealth of information.

By way of constructive criticism we have a few points which may be considered in preparing the final EIS. The Draft EIS recognizes many potential impacts which the coal development may cause. While it is essential that these be identified, it is our feeling that certain of the impacts are overstated and in some instances contradictory. For example, see page III-103. While mining will doubtless cause disturbance of soils on the mined area, it is unlikely to result in destruction of all soil properties. Experience has shown replacement of top soil on mine spoils usually provides a satisfactory medium for successful plant establishment even though some structure is lost and there is mixing of horizons, which in the dry Plains environment are often not well defined.

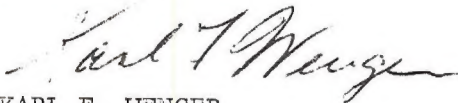
The impacts of the mining activity on the vegetation (pages III-110 through III-112) and wildlife (pages III-116 and 117) seem to portray unnecessarily bleak impacts. With studies being conducted by the University of Wyoming information will be available to ascertain whether toxic materials are present in the overburden. Preliminary data indicate there is no problem with trace elements in the overburden. It seems improbable that 6,500 acres of habitat will be destroyed if reclamation occurs as planned. It would seem that habitat would actually be improved with successful reclamation because of the increased diversity that would be introduced. Furthermore, observations at the AMAX Belle Ayr Mine have shown antelope and deer to be only minimally disturbed by the mining activity. Also,

whether elk will be so disturbed as to be forced from their present habitat seems to us questionable. We are also doubtful that strip mined areas cannot be satisfactorily revegetated with vegetation that will satisfy at least a portion of the needs of deer and antelope. (On page III-112 a concern was expressed that young vegetation on reclaimed areas will attract wildlife; however, in this case the impact stressed was negative.)

The statement on page III-148 that a 50 percent loss in productivity will result even on successfully reclaimed areas does not seem justified without supporting evidence. We recognize that this is one of the Analysis Guidelines under which the EIS was prepared; however, where it is stated on page III-148 it appears to be fact.

We hope these few items will be helpful to you in finalizing the EIS.

Sincerely,



KARL F. WENGER
Director



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UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Intermountain Forest & Range Experiment Station
507 - 25th Street
Ogden, Utah 84401



1630

July 5, 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

This letter responds to the invitation to comment on the Draft Environmental Impact Statement, "Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming." The five volumes, aggregating hundreds and hundreds of pages and weighing approximately 13 pounds, were addressed to me personally and not to our Station. Accordingly, my comments reflect my personal views and not necessarily those of other personnel here. Also, may I add that I know several of the members of the team that prepared the statement, and my comments are not directed to them personally. Rather, I am critical of and quite concerned about the report in general.

When I first saw the report, I was overwhelmed by its voluminousness. Having spent several days reviewing it, I am now trying to ferret out of the maze of detail the salient features. It is a dismaying experience. This report covers a study area of about 4,978,560 acres. If a comparable report were prepared for the entire United States, it would weigh (on a prorated basis) about three and one-quarter tons. I simply don't believe we can gain the proper perspective of environmental analysis by such volumes of writing.

I am concerned about the endless repetition in the report. The same information is repeated over and over again, until the reader becomes bored or perhaps calloused. Really, the area under consideration is relatively uniform in many respects. Could this not be treated once and then dropped, rather than being belabored?

Now for some specific comments:

Vol. I, page I-59, item 4. Why will there be a 5-year timelag in reclamation efforts for mined areas? Cannot this be reduced to 1 or 2 years?

Item 7. Here, and elsewhere, reference is made to a 50 percent loss in productivity for grazing purposes. Upon what factual

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evidence is this assumption based? What is the projected time-frame for such a reduction? Might not productivity actually be increased in certain instances?

Vol. I, page I-438, table 63. I feel certain the unit in the last column should be square miles rather than acres.

Vol. II, page I-523. The general observations concerning the nature of the vegetative cover which will be established appear tenuous and unsubstantiated.

Vol. II, page I-593, last paragraph. Reference to a possible increase in the number of unwed mothers is sheer speculation, and--in my opinion--has no place in such a report.

Vol. II, page I-622 and elsewhere. What is preplanning? It's really planning.

Vol. II, page I-627. Listering? Should it be listing?

Vol. II, pages I-627--633. These pages reflect not only an analysis, but include prescriptions, requirements, etc. They mix apples and oranges.

Vol. II, page I-655, 3rd paragraph. On what basis is the flat prediction of 50 years of plant succession required? May be much more or somewhat less.

Vol. II. Beginning page I-707, this entire section seems almost irrelevant to me. Of course there are alternative sources of energy--they are being developed--they are not substitutes for coal, rather they all complement each other--and they are far removed from Campbell and Converse Counties. Why do they deserve such a play in this report for such a localized area considering coal?

Vol. III, page III-1, and all of Vol. IV. Is it really necessary to go into so much repetitive details on the coal mines? Before the time the reader finishes, he is apt to close up the report, lay it aside, and say: "Ho! hum!."

I question the appropriateness of including such minute details of the mining operation, down to and including specific pieces, models, and sizes of equipment on hand and that likely to be needed. Some of this material, in my opinion, borders on proprietary information

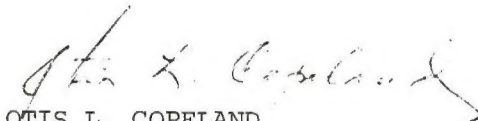
Why consider nonviable alternatives? For example, in-situ production of gas is not even perfected--yet a lengthy treatment is repetitively given it. The same applies to auger mining.

It is my opinion that to inject a projection of fatalities associated with a given life expectancy of a mine or a total production is going entirely too far--verging on the ridiculous.

The essence of this report, I believe could be shrunk to approximately one volume, present the pertinent information, hold the reader's interest, constitute an important document, and reduce the paper pollution.

If my remarks seem critical, it simply results from the deluge of pages upon pages of Environmental Impact Statements received in a steady stream--and, sometimes, with only a few hours to review to comply with a reply due date. I hope my comments will be construed as intended to help sharpen and condense any revised draft.

Sincerely,



OTIS L. COPELAND
Assistant Director for
Planning & Application

Dear Sir: 10

July 8

I wish to notify the "hearings" on the
Poudre River Basin project that I feel water
is a precious resource and that strict
controls should be enforced - we have
found in Minnesota that it is hard to change
pollution once it is started - in our dealing
with steel companies.

I hope adequate rehabilitation of strip
mine areas is required.

I do not favor dam on Clark Fork -
I don't think water needed in the area should be
used for making electricity for ^{Richmond} ^{Barbara} ^{Culpeper}
5424 RICHMOND C. 104
N 125 MN 55478



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

REGION VIII

FEDERAL OFFICE BUILDING

19TH AND STOUT STREETS

DENVER, COLORADO 80202

July 8, 1974

OFFICE OF THE REGIONAL DIRECTOR

Daniel P. Baker, State Director
Bureau of Land Management
Department of Interior
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

The Department of Health, Education and Welfare has completed its review of the Draft Environmental Impact Statement on the Development of Coal Resources in the Eastern Powder River Coal Basin in Wyoming.

It appears to us that the potential environmental impacts of the proposed action have been adequately addressed and we would concur with the document as written.

Yours very truly,

John L. Garfield, Deputy
John L. Garfield
Regional Director

cc: Office of Environmental Affairs
Att: Phyllis Hayes
Council on Environmental Quality
Att: Warren Muir



Getty Oil Company | 3810 Wilshire Boulevard, Los Angeles, California 90010 • Telephone: (213) 381-7151

Minerals Exploration Department Siegfried Muessig, Manager

July 12, 1974

State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Re: Comments on Powder River Basin
Draft Environmental Impact Statement

Dear Sir:

We wish to submit for your consideration some general comments on the Draft Environmental Impact Statement for Development of Coal Resources in the Eastern Powder River Coal Basin, dated May 31, 1974.

It is very clear that there is a National need to expand our production of energy resources in the United States to reduce our National dependence on foreign energy sources and to meet our expanding requirements in future years. If we are to maintain our current way of life, and improve our way of life in future years, it is necessary that the Nation increase its production of energy resources.

The Eastern portion of the Powder River basin in Wyoming contains one of the largest coal reserves in the United States and World. The coals in this area are some of the thickest in the United States and have a low sulphur content. The surface mining of these coals would disturb a minimum land area and is believed to have a minimum adverse environmental impact on the United States.

Development of surface mines, railroads, and auxiliary facilities will be required to produce these coal resources. These developments in this part of Wyoming will bring the development of the area to only a fraction of the development that exists in the Eastern United States and other parts of this country. Such development, if properly controlled, can improve the way of life of the people in Eastern Wyoming and for all the people of the United States.



State Director
Bureau of Land Management
July 12, 1974
Page ... 2

It is in the National interest and security that development of the specific proposed coal mines and auxiliary facilities such as the railroad discussed in the EIS proceed immediately under acceptable controls. To meet the large future energy requirements of our Nation, it is Getty Oil Company's view that additional coal lands in this area should be leased immediately. In development of any resource, the first step is acquiring the reserves. There is a very large lead time required prior to first production for mine planning, environmental and governmental approvals, acquiring equipment, financing and marketing. In addition, these type operations need a long life to depreciate the large capital investments. It is necessary to immediately lease significant additional coal reserves in this area to satisfy the future requirements of our society.

Getty Oil Company believes that surface mining of coal in the East Powder River Basin and the installation of required auxiliary facilities under proper environmental controls, will have a beneficial effect on the local area and Nation, and outweigh any adverse environmental factors.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'Smurphy'.

SM:KMR:bl

Copper Mine Road
R. F. D. 1
Bristol, Connecticut 06010
July 13, 1974

State Director
Bureau of Land Management
Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

Please include this statement in your hearing record as one very much opposed to BLM's plan for coal development and related operations in Wyoming's Powder River Basin.

I have traveled through this country and it is very beautiful. If your plan materializes, much of Wyoming would be transformed into vast strip-mine pits, railroad lines, power and coal gasification plants, industrial areas, and large population centers. The result would be social and environmental upheaval. Production would require vast amounts of water from a water-poor area and would jeopardize the water supply there. It is now primarily an agricultural area and should remain that way.

Evidently the Administration wants to use this as a major electricity base for other parts of the country--but the need can be met some other way if there is a need, which is doubtful. Has the Administration ever heard of the word "conserve"? In the words of President Nixon, we can have "all the energy we need" by 1980 (by using up our own sources of supply). I wish Mr. Nixon would give the American people some leadership and some patriotic incentive for preserving and protecting our land and our environment rather than to appeal as he has done to our selfish and material interests. I am sure the majority of the American people would respond.

I say the Powder River Basin should not be transformed into an electricity power base, and I do say that the emphasis ought to be on saving energy instead of wasting it and on curbing consumption rather than on attempting to make the supply meet the ever-increasing demand.

Sincerely yours,

Faye L. Hart
Faye L. Hart

July 8, 1974
Sundance, WY

USDI - BUREAU OF LAND MANAGEMENT
Federal Building
Cheyenne, Wyoming 82001

Sirs:

I was unable to attend the recent coal hearings at Gillette, but would like to testify. I am writing as a professional range conservationist and with interest in my family's ranch in the coal fields near Gillette.

First, I feel the coal is needed and if the following conditions are met, should be mined until a good clean substitute is found.

Secondly, I feel that the people who need the coal should suffer the loss of environmental quality, which will come from the conversion to a useful power source. We do not want or need gasification or more power plants in Wyoming.

Thirdly, in my experience, both in ranching and reclamation work, I know that the land can be reclaimed; but the laws will need to be much more stringent than they are at present. When every yard of overburden, both top and subsoil, must be loaded, moved and replaced, there is no reason why it cannot be replaced in the most perfect manner known by man. That is to say the slope, contour, the waterways, the terraces, everything could be laid back in the best manner possible. The additional expense would only be in the planning and layout as the dirt must be moved anyway.

Any person who has ranched in Campbell County can tell you their land is productive if they can retain the moisture that falls. This could be done with a topography which was manipulated totally to man's best interest.

In summary, I feel that strip mining in Northeast Wyoming could be tolerated and possibly even environmentally beneficial if:

1. The coal is burned outside Wyoming.
2. The overburden is replaced in the vertical order in which it comes off.
3. The completed landscape is replaced in the best manner known to man, with computers and other scientific knowledge used to balance yardage so that every yard removed will have its exact place to be replaced.

If these things are made mandatory by law and strictly enforced Wyoming will be productive for future generations and even a show place of accomplishment.

Respectfully submitted,


John E. Mooney

15

2389 Floral Hill Dr
Eugene, Ore 97403
July 15, 1974

State Director
Bureau of Land Management
Box 1828
Cheyenne Wyoming 82001

Dear Sir:

Please include this in the hearing
record on Development of coal
resources in the Eastern
Powder River Coal Basin.

I oppose this large scale energy
development as is being proposed.
for the reasons:

(1) Water should not be taken
from agriculture. use and
diverted for power development
Food is going to be more critical
in years to come than energy -
energy for air conditioning and other
wasteful uses

(2) There should be no new water

impairment projects for power development. We need the few remaining free flowing rivers for fish, wildlife, recreation and for future generations. The world was not intended solely for our use today. We must share it with other creatures and with people yet to come.

- ③ Sooner or later we must learn to live with less energy and with less wasteful ways. We must also develop non polluting sources of energy. (which excludes nuclear power)

Let us get started in the direction that we must go.

Wyoming coal can be utilized - but there are two requirements.

(1) The coal needs to be exported to the east where there is no water and where it can be used without destroying the precious, local water resources.

(2) After mining, the land should be restored to its original condition.

Shipping the coal and restoring the land will cost money.

The added cost will encourage more judicious and careful use of the electricity.

We can ill afford to destroy the land and water resources for cheap electricity. We must learn to live within the limits of our resources and to protect the environment. The Powder river project does neither.

Sincerely

R. Marrison Orum

PANHANDLE EASTERN PIPE LINE COMPANY
3000 BISSONNET AVENUE
P. O. BOX 1642
HOUSTON, TEXAS 77001

July 15, 1974

State Director
Bureau of Land Management
Wyoming State Office
P. O. Box 1828
Cheyenne, Wyoming 82001

Subject: Comments on Draft Environmental Impact Statement
for Eastern Powder River Coal Basin

Gentlemen:

We wish to take this opportunity to comment on the Draft Environmental Impact Statement. The team is to be commended for the effort of compiling, analyzing and editing such a monumental document. The comments presented are in the form of two general notes and several specific items.

Panhandle Eastern's primary interest is in the information contained about coal gasification in general and the Panhandle project in particular. In the preparation of the statement the EIS team used several sources of information about coal gasification. This is a good practice; however, some confusion could arise from making conclusions about Wyoming gasification plants from data based on conditions in other areas, namely New Mexico and the eastern states. Therefore we would urge clear reference to the data used to reach the various conclusions.

When speaking of impacts on air quality, conclusions about effects on health, visibility, etc. cannot be drawn from emission statistics alone. The emissions must be related to air quality in some analytical or empirical manner. This step would appear to be out of the scope of the statement since none of the plants are considered as site specific projects. Therefore, quantitative statements about detrimental effects of emissions are not properly justified.

Most of the information presented is factual and reasonable; however the manner in which it is presented could leave a wrong impression with the reader in a few areas which are enumerated below.

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On page I-100, there is the reference that nonsaleable by-products will require adequate storage facilities. This is not quite a correct statement because we have determined that all by-products currently have a ready market. This determination is based on market surveys and direct inquiries from potential purchasers and includes all liquid hydrocarbon products, ammonia, and sulfur.

In Table 1, page I-464, the emissions are presented in an unrealistic manner. The estimate of particulate matter is reasonable, but under current laws and regulations the plants cannot operate uncontrolled. This makes the addition of projected emissions to the existing emissions unrealistic because this cannot occur. A more realistic approach is shown on page I-647 where the controlled particulates are added to the existing emissions giving a much more accurate picture, but even this is not totally correct. As Mr. Moench testified at the hearings, new equipment to be installed at the Dave Johnston Power Plant will reduce particulate emissions of the existing source. If this is considered, the table on page I-647 will surely show a significant reduction of particulate emissions in the Basin even with the projected development.

Also in Table 1, page I-464, the SO₂ emissions shown for the gasification plant are not totally uncontrolled. This number of 10,800 tons per year does not include the sulfur that is converted to elemental sulfur in pollution control equipment. If this is included as SO₂ the total becomes 52,000 tons per year of uncontrolled SO₂ emissions. This then is a reduction of sulfur emissions of approximately 80%. These figures would then be more meaningful when the Table on page I-647 is compared with page I-464.

Also on page I-464 the table shows carbon dioxide emissions for only gasification plants. Since carbon dioxide is one of the major products of the combustion of coal, the power plants must also emit considerable quantities of carbon dioxide. While this is unimportant from a pollution standpoint, the picture presented is not exactly correct.

On page I-705 the number of 30 million gallons per day for a water-cooled plant may be correct, but it seems unlikely that such a plant would be built in Wyoming where water is scarce. Also, it is our intention to sell all by-products to readily available markets making recirculation or disposal systems unnecessary.

Bureau of Land Management

-3-


July 15, 1974

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On page I-706 the reference to 13,000 acres occupied by gasification plants appears high. The 1,000 acres per plant quoted on the previous page would give a total of 2,000 acres for the two plants considered in the draft statement.

These are our comments on the Draft Statement and they represent only a minor portion of the total document. They are offered only to help display the facts and analysis of coal gasification in a clear and concise manner.

Very truly yours,



K. L. Ancell
Project Manager

KLA/md

17

Southwestern
PUBLIC SERVICE
Company

P. O. BOX 1261 • AMARILLO, TEXAS 79170

July 17, 1974

H. O. HODSON
VICE PRESIDENT
ENGINEERING & CONSTRUCTION

Mr. Daniel P. Baker, State Director
Bureau of Land Management
Box 1828
Cheyenne, WY 82001

Re: Statement for the Record; Environmental
Impact Statement - Coal Reserves Develop-
ment, Eastern Powder River Coal Basin,
Wyoming

Dear Mr. Baker:

Southwestern Public Service Company, a New Mexico corporation, is basically an electric utility, with principal and corporate office located in Amarillo, Potter County, Texas; address 6th & Tyler Streets (mail: Box 1261, zip 79170).

This statement is prepared and submitted by H. O. Hodson, Vice President in Charge of Engineering & Construction, and Registered Professional Engineer in Texas, New Mexico, Oklahoma and Kansas.

Southwestern Public Service Company (hereafter referred to as Company) operates in portions of four states (see enclosed map). The Company's service area comprises some 45,000 square miles.

The Company has total installed generating capacity of 2,255,100 KW as of this date. All of this capacity is dependent upon natural gas as the basic fuel. Number 2 fuel oil, standby capability, is provided for a total of 1,317,500 KW of this capacity. The balance of the generating capability is served by two or more fuel gas suppliers.

The Company's gross system peak for the current month to date is 1,862 MW. Expected gross peak for the fiscal year ending August, is 1,892 MW; expected gross generation for the fiscal year is 9,528.8 MILLION KWH; expected annual load factor is 60.72%. The Company served 243,558 customers (meters) as of 30 May, 1974, an increase of 6,780 (or 2.86%) in the past twelve months.

Revenues derived from each class of service are approximately equal,

H. O. Hodson
to
D. P. Baker, BLM, Cheyenne, WY

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Page 2

July 17, 1974

and all classes of service have shown substantially the same rates of growth (see page 22 of enclosed copy of Annual Report).

The Company realized some three years ago that natural gas would not be available for new generating capacity additions committed after that date. The Company committed itself to coal as fuel for all new generating capacity to be placed in service between 1975 and 1990 (with the possible exception of a demonstration nuclear breeder reactor of 300 MW rating for 1984 consideration).

The Company's planned new generating capacity additions between 1975 and 1990 total 2,559 MW.

The Company has under construction at this time a 350 MW coal-fired unit for 1976 completion; the second coal-fired unit is committed to the manufacturers for 1979 completion.

The Company has entered into a coal supply contract with Atlantic Richfield Company. This contract is dated 25 April, 1973. This contract provides for "life of the unit coal" for the Company's first three coal-fired units; each one rated 350 MW and each unit requiring an average of 1,000,000 tons of coal annually.

Atlantic Richfield Company proposes to supply this coal from its Black Thunder Mine, to be located in T43N, R70W, Campbell County, Wyoming. Atlantic has obligated itself to make coal available to the Company starting October, 1975.

The coal contract provides for total coal reserves committed to the Company of 113,000,000 tons. The coal will move by 110 car unit trains from the mine to point of use near Amarillo, Texas. The trains will move over Burlington Northern Railroad (or subsidiary company) rails.

The unit train must operate on an average of eighty-seven and one-half ($87\frac{1}{2}$) hours per round trip in order that it may deliver the required 1,000,000 tons of coal (per generating unit) annually. This schedule cannot be maintained unless and until new rail facilities are constructed between Douglas and Gillette, Wyoming, as now proposed and contemplated by this impact statement.

There is no other fuel alternative available to the Company. Coal must be made available and used by the Company, starting October, 1975 if the Company is to avoid serious curtailments to essential electric energy requirements of this area. The Company is presently experiencing extensive and serious curtailments of its contracted natural gas supply for its existing generating capacity. The Company is forced, on an almost daily basis, to burn substantial quantities of the area's very limited supply of fuel oil.

H. O. Hodson
to
D. P. Baker, BLM, Cheyenne, WY

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Page 3
July 17, 1974

The Company aggressively seeks out, and purchases, where and when possible, new supplies of natural gas and oil. A separate fuel supply subsidiary has been formed for this purpose. Our most aggressive efforts in this area have not produced sufficient new gas supplies to offset deep and lasting curtailments of supply from our normal contract sources. The Company's fuel supply situation is critical and shows no signs of improving until the Company can accomplish a gradual shift to coal.

The boiler for the Company's first coal-fired unit has the capability of burning oil, gas, municipal refuse, or coal - in various combinations, if necessary.

The Company is actively involved in a solar energy research project with NASA-Lewis, Southwest Research, and Westinghouse. Some very small energy supply may become available from these efforts within five to six years.

The Company is an active (and financial) participant with Garrett Research and Development Company (Occidental Petroleum Company) in an in-situ shale oil extraction research project, and possible commercial venture, in southwestern Colorado.

The Company is currently discussing possible location of the world's first helium cooled breeder reactor, a demonstration unit of 300 MW(e) in the Company's service area. If these discussions lead to a decision to locate this unit in the Company's service area, the unit would be in operation by 1984.

All of this adds up to the fact that the Company is doing its d....est to stay on top of its fuel supply problems. Without Wyoming coal we are in trouble; without your endorsement of the plan to provide coal from Wyoming, we are in trouble! Let's get on with the show; no other area in the world can make so much necessary fuel (coal) available with so little damage to the environment (if any) as the Eastern Powder River Basin of Wyoming.

Without an early access to the coal supply, our nation is in deep trouble - much of this nation's oil refining capability is dependent upon the electric energy supply of the Southwest.

Yes, the Company is making an all-out effort to satisfy the EPA stack gas emission requirements, on all of its coal-burning boilers. A \$20,000,000 commitment, for precipitators and scrubbers on its first coal-fired unit, while not a guarantee of success, does provide some assurance of success in that effort.

If the Company is not successful in keeping a natural gas supply under

H. O. Hodson
to
D. P. Baker, BLM, Cheyenne, WY

17

Page 4

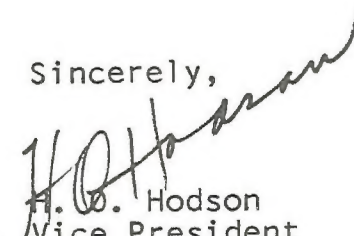
July 17, 1974

its present gas-fueled boilers; coal gasification at the power plant site(s) may be the only viable alternative. The Company's annual coal requirements could become 10,000,000 tons by 1985 (if coal gasification becomes necessary). The Company's gas-fueled boilers cannot be converted to direct coal firing, and satisfy EPA requirements.

Coal gasification, at the generating plant site(s), permits improved thermal efficiencies in fuel utilization.

The 1,000,000 (plus or minus) residents of the Company's service area will be mighty disappointed if Wyoming coal is not made available to the Company as requested.

Sincerely,


H. O. Hodson
Vice President

dp



18
United States Department of the Interior

NATIONAL PARK SERVICE

ROCKY MOUNTAIN REGIONAL OFFICE

655 Parfet Street

P.O. BOX 25287

Denver, Colorado 80225

IN REPLY REFER TO:

L7619 (RMR)CS

JUL 18 1974

Memorandum

To: State Director, Bureau of Land Management,
Cheyenne, Wyoming

From: Regional Director, Rocky Mountain Region

Subject: Draft Environmental Statement, Eastern Powder
River Coal Basin, Wyoming (DES 74-65)

No established or studied units of the National Park System will be affected by the proposed development of coal resources in the Eastern Powder River Coal Basin with the exception of Devils Tower National Monument.

The proposed developments may also have indirect effect upon Fort Phil Kearney and related sites; this is a registered National Historic Landmark. No other National Historic or Environmental Education Landmarks fall directly within the designated area for development.

We note that there is no reference to Natural Landmarks in the Draft Environmental Statement. The National Environmental Policy Act of 1969, Section 101 (b) (4) states that one objective is to "preserve important * * * natural aspects of our national heritage * * *." All Federal Agencies should take cognizance of the sites included in the National Registry of Natural Landmarks to fulfill the intent of Section 102 of this legislation. We cite this authority because Lance Creek Fossil Area is a registered Natural Landmark in the near vicinity of proposed developments and must be protected.

Other natural landmark sites that have been identified as being potentially eligible for listing on the National Registry of Natural Landmarks and as such are entitled to similar protection are as follows:



1. Missouri Buttes: About four miles northeast of Devils Tower. This belongs to the themes illustrated by the Works of Volcanism Great Plains Province, Unglaciaded Missouri Plateau Section.
2. Inyon Kara Mountain: South of Sundance, belongs also to the Works of Volcanism as cited above.
3. Ruzet Escarpment: In Campbell County, belongs in the themes illustrated by the Works of Streams Great Plains Province, Unglaciaded Missouri Plateau Section.
4. Hat Creek Breaks: In Niobrara County, which also belongs in the theme illustrated by the Works of Streams.
5. Pumpkin Butte: Northwest of Pinetree on State 387 in Campbell County, which also belongs in the themes illustrated by the Works of Streams.
6. Sundance Mountain: South of Sundance in Crook County is identified with the themes illustrated by the Works of Volcanism Great Plains Province, Unglaciaded Missouri Plateau Section.

The Final Environmental Statement should reflect consultation with the Federal Register for February 19, 1974, and all succeeding monthly supplements in which the complete listing of sites on the National Register is published. In addition to the historical sites listed within the limits of the project area, there is one additional site which should be cited. This was entered upon the National Register February 12, 1974, and is Big Goose Creek Buffalo Jump, Sheridan County, Wyoming. Any sites affected by project developments will require compliance with Section 106 of the National Historic Preservation Act of 1966 (P.L. 89-665) and with the Advisory Council on Historic Preservation's "Procedures for the Protection of Historic and Cultural Properties."

The Draft Environmental Statement establishes that there has been maintained a close working relationship with the State Historic Preservation Officer for Wyoming and members of his staff. It establishes that there is full awareness of Legislative and Executive enactments designed to protect cultural resources. It also establishes that professional surveys have been made in some areas to

assess the significance of historical, archeological, and paleontological resources. This is commendable as far as it goes, but it is also apparent that there are considerable areas yet to be surveyed. Complete compliance with the Environmental Policy Act of 1969 and with Executive Order 11593 requires that surveys leading to the identification and evaluation of all cultural resources within the proposed project development area be completed in advance of any construction. If such resources will be adversely affected, and it appears they will be from a reading of the pertinent sections titled: "Probable Adverse Environmental Effects Which Cannot Be Avoided," then this becomes a matter for further Advisory Council review and consultation.

The Final Environmental Statement should present the results of all archeological surveys and arrangements that have been made either to preserve or mitigate the impact upon threatened cultural remains through professional archeological salvage excavation.

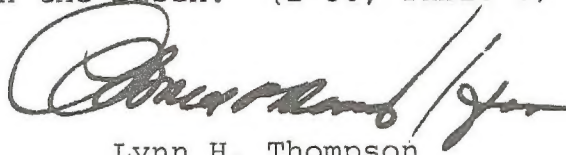
The statement should address itself to the problem of finding more positive alternatives than outright obliteration of any sites that may be found to possess more than passing significance. It would also be desirable for this statement to present a detailed discussion of what procedures will be followed should previously unknown archeological or paleontological resources be encountered during project development.

In a number of places (e.g. pages II-135 and IV-134) the State Historic Preservation Officer and the State Archeologist are confused. Also (pp. V-77, V-132, VI-104) the State Historic Preservation Officer is referred to as the "State Historian."

On page I-285 it is stated that the surveys made of the Carter and Kerr-McGee leases were not intensive and that they have potential for more sites. The Wyodak lease which has no survey (only a statement declaring "no archeological values exist" VI-79) should, along with the Carter and Kerr-McGee leases, have intensive surveys conducted by professional archeologists in order to locate and assess presently unrecorded archeological resources. No provision has been made for surveys along pipeline right-of-way or transmission line corridors where archeological remains could logically be found. Provision should also be made for the protection of cultural resources uncovered during construction.

Since the right-of-way for the proposed railroad has not yet been intensively surveyed (p. II-66), it is unclear how the judgment of impact to archeological resources shown on the chart on page II-166 could have been made.

The discussion of alternatives in the statement on coal development is incomplete. The statement indicates that coal is available in Colorado, Nebraska, Montana, North Dakota, and South Dakota but does not indicate the amount of coal to be mined in those states. The statement leaves the impression that only Wyoming is to be mined. In addition, the report does not speak of coal exports from the United States which amounts to about 53 million tons annually, more than the amount proposed to be mined in the Basin. (I-36, Table 3)

A handwritten signature in dark ink, appearing to read "Lynn H. Thompson", with a stylized flourish at the end.

Lynn H. Thompson



IN REPLY
REFER TO: 160
125.-

19

United States Department of the Interior

BUREAU OF RECLAMATION

Upper Missouri Region

P.O. Box 2553

Billings, Montana 59103

JUL 19 1974

Memorandum

To: State Director, Bureau of Land Management, Cheyenne, Wyoming

From: Regional Director, Billings, Montana

Subject: Review of Draft Environmental Impact Statement on Development of Coal Resources in the Eastern Outer River Coal Basin, Campbell and Converse Counties, Wyoming (DES74/65)

We were pleased to review the draft statement as requested. Putting it together was clearly a monumental task.

We note that the level of development envisioned appears to correspond with the lower level of development under the Northern Great Plains Resource Program. The most probable level of development scenario might be a better choice. We understand the reasons for confining discussion of the impacts of the various developments to those which will occur in the immediate vicinity of the mine. Never-the-less, it may be a mistake to ignore the significant consequences of construction of several hundred miles of transmission line associated with the Wyo/Dak mine and the impacts on the railroad network required to deliver the coal to Midwestern and other plants.

Comments on specific pages follow:

Volume 1

I - 266-267

We note the figures given for pipeline cost are apparently based on our Montana-Wyoming aquaduct study. More recent studies for the Northern Great Plains Resource Program based on higher pumping costs, higher interest rates, and a shorter amortization period indicate that the dollar cost per acre foot may be nearly double those shown in the draft.

Volume 3

19

II - 33

A more definite commitment on the removal and saving of topsoil is desirable than simply stating that this will be done "where it is practical."

II - 85

The statement is made that the examination of off-site impacts is beyond the scope of this statement. As pointed out previously, we believe adhering to this policy in relationship to impacts caused directly by the operation of the mines may be misleading. Elsewhere in the statement, a figure of road-crossing blockage for 84 minutes a day by 1980 and 161 minutes per day is estimated for the BN/CW Railroad just in the Powder River Basin. There will surely be a major impact in other areas, especially when coupled with impacts from trains serving other mines.

II - 108

There appears to be an inconsistency between a statement here and one made on page II - 29 to the effect that fences will be constructed. On page 108, the statement is made that in all probability the railroad right-of-way will be fenced.

III - 5

We believe it would be helpful to indicate that the Kerr-McGee mine is discussed in Volume 4 of the draft impact statement. The reference to this mine and the Peabody mine on this page, confirms the difficulty of attempting to distinguish the impacts of the specific mine covered by the draft statement and of other operations being conducted simultaneously in the same area.

III - 21

Will the air and water quality monitoring stations be conducted by the company or under contract by some other entity? What use will be made of the data? There is no indication that any changes in operation will be made in the event adverse consequences of the mining are determined.

Volume 4

VI - 11

What is the estimated acreage of the lake likely to be formed in the spoil area?

VI - 39

The statement is made that about 60% of the leased area drains into Donkey Creek, a tributary of the Belle Fourche River. If a lake is constructed in the mined area as proposed, flows into the Belle Fourche would be reduced. What will be the impact on the river as a result of reduction of flow in Donkey Creek? Data on the present flows in Donkey Creek would be useful.

VI - 63

A great deal of information is given on what emissions would be without controls. A reference to the table on page VI - 116 describing what emissions will be with controls would be helpful in putting the impacts in perspective and in relieving the reader's apprehension.

VI - 77

We wonder about the need to use herbicide for maintenance of power lines, rights-of-way in a grassland-sagebrush shrub area. We doubt if they would be needed, and therefore this potential adverse impact would be avoided.

VI - 89


The discussion here on the possible pollution of underground water with toxic mine wastes is inconsistent with the statement on page VI - 71 to the effect that aquifers would not be affected.

VI - 98

The statement that water in the pit could exceed 6,000 milligrams per liter in total dissolved solids, indicates that the water would not be suitable for most forms of fresh-water fish. Therefore, retention of the mine as a fishing pond might not be practical.

VI - 105

The statement that native vegetation will be used where "practical and seed is available" is weak and could be easily construed to not require use of native vegetation wherever it were inconvenient.



JOHN R. SWANSON
P. O. Box 922
Berkeley, California 94701

July 13, 1979

Bureau of Land Management
Box 1828
Cheyenne, Wyoming 82001

Dear Sirs,

Please accept my comments, as follows, concerning the Powder River Basin EIS.

The Powder River Basin EIS does afford some attention to the substantial environmental damage that will occur to this Basin if even the initial plans for this area materialize.

Enormous changes from the current rural atmosphere of this Basin to a semi-urban, primarily industrial, complex will develop even in the early years of coal exploitation as now planned.

Proposed Land, Air and Water Pollution will swiftly establish itself in this entire Basin if the initial coal development plans occur. Land, Air Pollution alone could well mean the end of a viable life-style in this entire Northeastern Portion of Wyoming.

Land Reclamation will mean the end of the land resource in this quarter of this state. And proposed Water Pollution could be so severe as to be a National Scandal. Wildlife, scenic and related natural resources will be very badly damaged and for all time, as well.

This Powder River Basin still remains a whole some rural portion of America. However, even slight Coal Exploitation will mean the ruination of this now important rural area.

In this regard, I firmly oppose any form of Coal Development in the Powder River Basin of Wyoming.

Sincerely, John R. Swanson.

July 19, 1974

Mr Daniel P Baker
 State Director
 Bureau of Land Management
 P O Box 1828
 Cheyenne, Wyoming 82001

Dear Mr Baker:

In response to your letter requesting comments on the environmental impact statement for the development of Eastern Powder River Coal Basin we wish the following statement be placed in the record.

The Oklahoma Electric Company is an electric public utility serving approximately 490,000 customers in a 30,000 square mile area containing over 1,300,000 people in the States of Oklahoma and Arkansas. The demand on this system has been growing steadily, and based upon historical growth trends will peak in future years as shown below:

<u>YEAR</u>	<u>MEGAWATTS</u>
1977	4375
1978	4775
1979	5200
1980	5660
1981	6150

In order to meet these future load requirements our Company will add to its generating system 2060 megawatts of additional capacity. OG&E has presently under construction at Muskogee, Oklahoma, two 515 megawatt generating units that are designed to use coal as a boiler fuel. These units are scheduled to be in commercial operation in February 1977 and February 1978 respectively. In addition, we are now acquiring land and ordering equipment for two more such units near Red Rock, Oklahoma, to be in commercial service in February 1979 and February 1980 respectively.

The decision to use coal as a boiler fuel for these units came hard to a Company that had relied for many years on what appeared at times to be an inexhaustible supply of natural gas. During the planning phase of these projects considerable effort was exerted to secure long term gas or oil contracts for these units. Nuclear power was considered. The fact emerged that no source of gas or oil in sufficient quantities and meeting State and Federal environmental regulations was available, and the lead time necessary for the construction of nuclear units precluded their use for these plants. This fact led us to the inescapable conclusion that all plants built by our Company through the middle 1980's would be coal-fired, and the only source of coal available in sufficient quantities, able to meet environmental requirements and capable of being developed in the allotted time frame was located at least in part in the Eastern Powder River Coal Basin.

July 19, 1974

To secure fuel for the four units mentioned earlier OG&E contracted with Atlantic-Richfield to supply coal for a period of 30 years. In order to meet our proposed schedules the shipment of coal from Wyoming must begin in mid-1976. For such shipments to be made on time it will be necessary that mining and transportation facilities be constructed well in advance of that date.

Obviously, we in Oklahoma cannot address ourselves to the primary environmental effects of the proposed action. However, it has become appropriate in recent years to consider the secondary effects and in some cases even the tertiary effects of pursuing or not pursuing a particular course. It is with this in mind that we would submit the following for your consideration.

If the OG&E cannot obtain coal from the Eastern Powder River Coal Basin and specifically the coal that was to be provided under our contract with Atlantic-Richfield it is certain that beginning in the year 1977 electric service to our customers will have to be curtailed. The following table shows by year the number of hours in which the total load could not be served and the number of customers, of all classes, affected.

<u>YEAR</u>	<u>NUMBER OF HOURS IN WHICH TOTAL LOAD COULD NOT BE SERVED</u>	<u>NUMBER OF CUSTOMERS OUT OF SERVICE</u>
1977	615	63,000
1978	1,030	111,000
1979	2,200	158,000
1980	3,390	203,000
1981	4,435	246,000

The sad fact shown by the table is that by 1981 load reduction measures would be in effect over 50% of the time and involve almost a quarter of a million customers. Much could be said about the inconvenience and even hardship that would accrue to many as a result of such a situation. The constant availability of an adequate supply of electric energy has become an integral part of our way of life. The immediate environmental and health impact on the public in our service area due to the curtailment of electric service to waste treatment and water purification facilities would indeed be grave. But in this time of energy crisis it might be enlightening to look at the impact of this curtailment on one particular group of our customers, the petroleum industry.

Oklahoma is an energy exporting state. In 1972 our state ranked fourth in the United States in the production of crude oil as well as being the hub of a vast petroleum transportation network. This coupled with a number of large refineries makes the petroleum industry in Oklahoma a vital part of this nation's energy production system. It may be helpful to look at the effect of the curtailment of electric supply on each of the major aspects of the industry. In 1972, the last year for which final figures are available there were approximately 75,000 oil and gas wells operating in the state. These wells produced an average of 681,257 barrels of product daily. Sources familiar with the industry estimate that over 50% of these wells are operated by electric pumps. Idling these pumps would drastically reduce the flow of crude oil and natural gas. Refineries that rely to a very large extent on electric motors and pumps for their operation would be forced to shut down or severely reduce production if required to operate on a schedule that would have electricity provided only half the time. Probably the most seriously affected

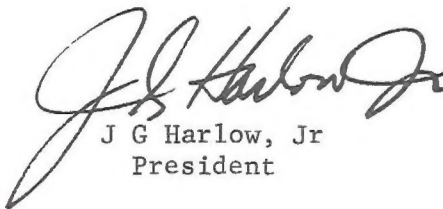
July 19, 1974

21

aspect of the petroleum industry would be the vast pipeline system used to transport crude oil, natural gas and finished product. Without electricity to power the pipeline pumps this vitally important transportation network would painfully come to a halt. What this points out is only one aspect of the interdependence of energy supply sources in this country. This interdependence must be fully considered in evaluating the impact of not allowing the proposed action.

In summary, our Company is committed to a course that depends upon the use of Wyoming coal. This commitment to the use of coal from the Eastern Powder River Coal Basin and the lead times involved in securing new generation leaves no viable alternative. The inability of our suppliers to provide that coal will severely affect not only our Company and the lives of thousands of our customers but the life stream of an already strained national energy production and supply system.

Sincerely,



J G Harlow, Jr
President

PJR:dj



22

United States Department of the Interior

OFFICE OF COAL RESEARCH
WASHINGTON, D.C. 20240

Daniel P. Baker, State Director
Bureau of Land Management
Post Office Box 1828
Cheyenne, Wyoming 82001

JUL 22 1974

Re: Draft Environmental Statement
Eastern Powder River Coal Basin

Dear Mr. Baker:

The Office of Coal Research (OCR) has reviewed the draft Environmental Impact Statement covering the Development of Coal Resources in the Eastern Powder River Coal Basin. The impacts of the four proposed mines and the railroad on the basin have received comprehensive review.

Additional consideration should be given to the ongoing development of clean coal conversion technology by the Office of Coal Research. The conversion technology is being developed within a context of environmental acceptability, and will be applicable to the coals of this Basin.

Coal can be shipped to distant energy markets as coal, or it can be converted to clean fuels, and then transported. The possibility of slurry pipelines should receive greater acknowledgment as it is a viable and competitive form of transport. Also, we believe that long distance transmission of coal generated electricity deserves consideration.

Thank you for the opportunity to review the draft.

Sincerely yours,

Acting
Director
Office of Coal Research

CHEYENNE HIGH PLAINS AUDUBON SOCIETY

P. O. Box 10281
Cheyenne, Wyoming 82001

July 23, 1974



Mr. Dan Baker
Wyoming State Director
U.S. Bureau of Land Management
Federal Office Building
Cheyenne, Wyoming 82001

Dear Mr. Baker:

This letter is in response to the DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE EASTERN POWDER RIVER BASIN OF WYOMING. These comments represent the views of the Board of Directors of the Cheyenne-High Plains Audubon Society and we would like to have them entered in the Hearing Record. First, we would like to make several general comments, then some specific statements.

In the future, a much more realistic time frame for response to a statement of this length should be established. An extension to August 2nd was granted only after complaints were made about the original date. Part of the problem was that the draft statement was five volumes long. It is supposed to be a scientifically sound treatment and, therefore, it is quite involved and necessitates a lot of time to accomplish a proper review. We feel the document was definitely too long and repetitious and this is one of the reasons more time was needed to review it.

An experienced, scientific writer should have been contracted to carefully read over the copy prior to publication and with authority to condense or revise it with the consent of the original authors. Thus could you have saved the rest of us a lot of time and most likely gained more specific and meaningful input during the hearings.

The summary in Volume I is not really a summary. Rather, it is a very sketchy outline and not a very good one at that. A summary is more like an abstract and is written in sentence form. The outline included is rather vague and incomplete, rendering it of doubtful use.

The glossary in Volume V is a good idea but there is no rationale stated for the words included. Why were the words in it included? The first word we attempted to look up in the glossary was "infrastructural" and it was not in the glossary! It would also help to have the page numbers after each word in the glossary to show where a word is used in the text.

During the Cheyenne hearing, there appeared, from testimony, to be some misunderstanding about the structure of the Audubon Society within Wyoming. While reference was made to a "Wyoming Audubon Society," such an organization does not exist. There are, in fact, five (5) separate chapters of the National Audubon Society in Wyoming in the communities of Cheyenne, Sheridan, Casper, Laramie and Rock-Springs/Green River.

These chapters operate independently of one another. That is, they are not under the direction of a "Wyoming Audubon Society" or "Wyoming Audubon Council" or any central board of directors or governing authority. While these chapters may engage in projects or make joint statements with other chapters, each is governed by its own group of officers and its own board of directors. Some of the misunderstanding may stem from the fact that the MURIE AUDUBON SOCIETY (Casper) originally was the Wyoming Audubon Society and the only chapter within the state.

As a result of this confusion, our chapter did not receive a copy of the draft statement. When we tried to obtain the volumes after the Cheyenne hearing, we were told that they could be made available only on loan since copies had been sent to the regional office of the National Audubon Society in Boulder, Colorado, and to the Wyoming Audubon Society.

If you wish, we would be happy to provide you with the names and addresses of the presidents of each of the Audubon chapters in Wyoming so that you may add them to your mailing list.

We do applaud your efforts to include the public in the hearings--and hopefully in the subsequent decision-making process as well. We would hope that additional hearings will be conducted prior to final preparation of the completed environmental impact statement on the Eastern Powder River Basin. We feel that development such as that discussed in the draft statement is inevitable in Wyoming. However, we believe that it should occur in the most ecologically sound way possible, and under strictly controlled conditions with proper assurance that such controls can and will be enforced.

Sincerely,



John W. Cornelison
President/for The Board of Directors

BURGESS & DAVIS

ATTORNEYS AT LAW
SHERIDAN, WYOMING
82801

HENRY A. BURGESS
RICHARD M. DAVIS, JR.

THOMAS C. WILSON
CHARLES R. HART

TELEPHONE
307-672-2173
P. O. BOX 728

July 25, 1974

Department of the Interior
Bureau of Land Management
State Office
Cheyenne, Wyoming 82001

Gentlemen:

Enclosed please find herewith ten copies of
a Statement in response to the Draft Environmental Im-
pact Statement on the development of coal resources
in the East Powder River Coal Basin.

Our firm represents some sixty landowners
in the Powder River area who will be directly affected
by any coal development in the area, and we wish to
submit this statement on behalf of our clients.

Yours very truly,

BURGESS & DAVIS

Richard M. Davis, Jr.
Richard M. Davis, Jr. *g*

RMD/cg

cc: Mr. Daniel P. Baker, State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

24 LANDOWNERS ORGANIZATION STATEMENT

OF

DRAFT ENVIRONMENTAL IMPACT STATEMENT

The Draft Environmental Impact Statement contains in the Summary Sheet, Vol. I, i, a summary of environmental impacts. The listing of the impacts is eloquent, not by reason of the subjects included, but for those omitted items. It does not mention the impact of Powder River Basin development plans upon the ranchers in the Basin. Nor does it mention the impact of the construction of the largest railroad line to be built in America in the twentieth century. It discusses the impact and computes the results as of 1980 as if after that date there will be no further impact. In fact, the impacts upon the area will be cumulative and progressive and far more degrading to the environment by 1990 than it will be in 1980.

The portion devoted to Agriculture, Vol. I, p. 369-380, and at several subsequent and disjointed places, is a mere statistical summary of the agricultural resources by the graziers of the affected area. The effect of the potential "impact" on agriculture is dismissed by a statistical summary of the "loss" of acres...4800 acres by 1980...7900 acres by 1985...9500 acres by 1990...and a cumulative loss of 5067 AUM's by 1990. Farming acreage loss is projected to be .7 of one percent of the total available agricultural land by 1990. But those items of "impact" relate only to the mined acres, not the lands taken or ranches severed by the railroad and assumes the only "impacted" lands will be those at mine and industrial sites.

Such statistics may be interesting to the people who prepared them. They may prove something to somebody. They do not demonstrate the impact of industrial development upon the agricultural economy of the ranches in the Powder River Basin. Nor do they portray a complete picture of the physical degradation which will be inflicted upon agriculture. Such omission can only stem from the complete and abysmal lack of understanding of the ranching economy of the Basin.

All of the agricultural economy in the area is based upon grazing livestock or supplying supplemental livestock feeds for winter use. Livestock, either sheep or cattle, need grass, water, and protection from the elements.

By polluting the air with mineral and ash discharges and dust, grass production may be reduced and sizeable areas of land may become unsuitable for forage production. Even though the vegetation is not destroyed, nor the degradation reach a level harmful to humans, the vegetation may still be rendered unfit for animal consumption. Activities, such as dust and noise, will discourage grazing in the proximity of such industrial activity and render much land unavailable for grazing. No reference to safe levels for livestock grazing is contained in the Draft.

Water, always in short supply in the Basin, is a necessity for livestock in all months of the year. It is derived from surface run off during the months of snow melts and "hard rains" or "cloud bursts". The Basin is noted for its small quantity of run off and only the persistency and ingenuity of man's efforts to impound that run off on the land where it originates by means of ditches, spreader dams and dikes, reservoirs and tanks, has made it possible to run livestock in the Basin.

If atmospheric discharges result in natural accumulations of minerals on the ground, will the surface water then be fit for livestock consumption? Or, must large areas of graze be abandoned?

Water is also derived from below the surface by means of springs and wells. Springs appear at low elevations where the terrain dips to the water table, or where a break in the strata permits water under pressure in the strata to rise to the surface. Wells are obtained by drilling to water producing strata. If the level of water is dropped significantly by opening of coal pits, there will be no springs and no wells which can economically produce livestock water. What are the results of the monitoring wells drilled by the companies in the Basin?

Why are the results from such wells not included in the Draft? The purported Statement ignores completely the impact on the water resource requirements of ranching operations existent within the Basin. A ranch dependent solely upon collections of surface water is not economically feasible, and a ranch deprived of its wells and springs will have to cease its operations.

Will strip mining drop the water table below the level to maintain existing springs? Will wells need be deepened to supply livestock water? Who will bear the cost of such reworking of wells and additional lifting costs? Will water be available for domestic use? Under the existing law, the rancher will probably have this financial burden. No mention is made of any of these "impacts" on agriculture.

As livestock are not wild animals free to migrate, it is imperative that the terrain in which they are pastured have administrative facilities, such as access roads and lanes, corrals, and buildings, and fences. Artificial barriers, such as fences, must be located so as not to trap livestock drifting with the wind in storms. Experience has shown that heavy livestock losses are caused in the spring when sheep and cattle drifting in front of a blizzard are trapped in corner fences or by obstacles. Such obstacles will proliferate with development in the Basin and by their location will effectively destroy the utilization of some acreage in winter and spring pastures or else result in large livestock losses. No mention is made of this in the Statement nor is consideration given to the problem of main line railroad, spur locations, width of rights-of-way, number of separate grade crossings for school buses, fencing specifications on impact of division of pastures by fences and cutting off livestock water from pastures and drying them up. Nor is consideration given to lessening the impact upon the ranching community by bringing the new line of the old Chicago Northwestern line at Douglas rather than East of Douglas.

None of the foregoing needs of livestock grazing are even mentioned in the study. Page 1-861 says, in six sentences, agricultural production will be lost, quantitatively stated, 2600 AUM's by 1990 for grazing and 1245 acres of cropland. Such figures mean nothing. They relate only to the land in the area of mining. No mention is made of

acres impacted by the railroad or loss of water and grazing resources. It is only when the nature of the industrial activity is translated into the world of the dumb animals dependent upon man for grass, water and shelter that the impact can be realized. No attempt is even attempted to correlate the effect upon grazing to the lives of the ranchers of the Basin dependent upon those animals.

Some sixty-one landowners between Douglas and Gillette will have their ranches severed physically by a strip or "transportation corridor" from two hundred to seven hundred feet wide as the result of construction of the largest railroad to be built in America in this century.

No mention is made of how livestock may cross such a corridor. An underpass that long will be a black hole full of rattlesnakes in the summer, tumbleweeds in the fall, snowdrifts in the winter, and mud in the spring. Neither man nor beast can be expected to attempt the Stygian crossing through such structure.

If the projected coal production results in a train every twenty-eight minutes, there will be no time available between trains and autos on the parallel roads to cross livestock nor sufficient cowboys and shearers to cross those ties, tracks, and macadam roads which appear ominous and deadly to livestock as any livestock man will attest.

Spurs from the main line of rails to the mines and attendant access roads will multiply the same problems.

No solution has been suggested to the problems of crossing railroads with fire fighting equipment, nor for administration of the ranches. Must a rancher go two miles or ten to cross a "transportation corridor" and then double back an equal number of miles to attend their livestock in calving and lambing, to salt, to feed, and to doctor them? In the absence of such convenient crossing, duplicating sets of corrals, chutes and sheds must be built. Additional traveled miles mean higher operating costs.

Is a railroad even necessary between Gillette and Douglas? Arrangements exist for extension of the

Burlington Northern line to serve the mines contemplated. But there is no need to build a new railroad line South to Douglas as demonstrated by the Draft. The landowners have been told their land is to be held in fee, which involves taking fee coal, fee producing oil and gas, and denies them the right to permit or withhold permission in the future to strip mine coal under the land taken.

To date, the Burlington Northern and Chicago Northwestern railroads have not advised the landowners of the location for the proposed railroad line. They have not discussed compensation nor crossings nor fences nor severance damages. Such items as location and compensation all reflect upon the impact upon the landowners. Not only are those items ignored in the Draft, but they are ignored and not discussed by the railroad companies.

All Statutes of Wyoming and the United States, and all the laws proposed, cannot and will not change the laws of nature existent in the Basin. With those forces and laws of nature, the residents of the Basin in the homestead days, learned to survive. In the droughts of the thirties, the Basin ranchers learned to adapt the country to a livestock economy, although fragile, it has been viable. Now an activity is to be interjected into the Basin which cannot do other than degrade the viability of the agricultural operations and in certain cases completely terminate those agricultural practices.

Residents of the Basin do not unalterably oppose the entry into the Basin of a coal economy. They are told the nation needs the coal for energy. However, the means of extracting the coal and the scale of the operations will exceed anything witnessed in America to date. The relative rights of the companies involved and the landowner-ranchers have been based upon laws enacted in the light of the art of coal mining of more than fifty years ago. The art has changed, but the laws have not. As a result, the landowner-rancher is being asked to contribute, not just a small tract of land to a coal mine, as the Statement would indicate, but his whole ranching operation to the recovery of coal.

This organization believes the Draft Statement is incomplete, based upon assumptions and lacking in appreciation of the problems which will be visited upon the

organization's members. It ill serves the people of the Basin and of Wyoming to allow the development of the proposed projects until the problems mentioned herein are studied further and solutions obtained to them. If an error is to be made in this area, let it be an error of delay and not of destruction.

A handwritten signature in cursive script, reading "Henry A. Burgess", is written over a horizontal line.

HENRY A. BURGESS
of the Firm

BURGESS & DAVIS

P. O. Box 728

Sheridan, Wyoming 82801



United States Department of the Interior

BUREAU OF MINES
WASHINGTON, D.C. 20240

July 26, 1974

Memorandum

To: State Director, Bureau of Land Management, Cheyenne, Wyoming

Through: *State* Assistant Secretary--Energy and Minerals *Buty*

From: Director, Bureau of Mines

Subject: Draft environmental impact statement on Regional Analysis and Site Analysis, Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming

Our Intermountain Field Operation Center has reviewed the five-volume draft environmental statement on Powder River coal development as requested. Specifically, the statement pertains to the development of coal resources in Eastern Powder River Basin, Campbell and Converse Counties, Wyoming.

An examination of library and file data, without benefit of field investigation, revealed that during 1971 mineral deposits in Campbell County yielded petroleum, natural gas, natural gas liquids, coal, and sand and gravel valued at about \$128.4 million. During the same period, deposits in Converse County yielded petroleum, coal, natural gas liquids, sand and gravel, and natural gas valued at about \$22.3 million.

Overall, we believe the interagency team from the Bureau of Land Management, Geological Survey, Forest Service, and Interstate Commerce Commission that prepared the draft did a good job. However, we submit the following comments that may be helpful in preparing the final statement:

Volume I

Page I-22, last sentence: Either add a sentence or modify the last sentence to indicate that underground mining research should develop new mining techniques that will yield a much higher percentage of recoverable coal than is possible with present methods. Bureau of Mines and industry research is aimed at this goal and we are confident that recovery will increase.

Memo. to: State Director, Bureau of Land Management, Cheyenne, Wyoming,
Subj: Regional Analysis and Site Analysis, Development of Coal
Resources in the Eastern Powder River Coal Basin of Wyoming

Pages I-30 and 32, last sentence: The statement "between two and three percent" should read "between 3 and 4 percent." This office checked with the Geological Survey authors of the section, and they agree with the latter.

Pages I-31 and I-57: The graph shown on page I-31 does not agree with the table for projected coal production appearing on page I-57. The production figures in the left-hand column of the table appear to be incorrect by a factor of 10.

Page I-41, 1st full sentence: The statement is made that one byproduct from a gasification plant will be 100 tons of sulfur per day. Although this chapter may not be the place for it, the problem of disposing of 100 tons of sulfur per day should be addressed somewhere in the environmental statement. Marketing may become a distinct problem considering the quantities of sulfur that are becoming available owing to antipollution laws.

Page I-94, next to the last sentence: One problem that may arise with in situ gasification is subsidence. Although the statement indicates that in situ mining should be considered for specific circumstances only, we believe that the possibility of subsidence is a problem serious enough to warrant mention.

Page I-163 and others: The terms scoria and clinker appear on this page and are used many times throughout the report to describe rock that was altered by the burning of underlying coal. A more correct term would be baked shale or porcellanite. At the urging of members of the Geological Survey, the term baked shale was used to describe such material in the Northern Great Plains study. We suggest the final environmental impact statement indicate an awareness of the terminology problem and use either baked shale or porcellanite rather than scoria or clinker.

Page I-184, 2d paragraph: The word "Bulletin" is omitted in the reference cited.

Page I-189: Pipelines are not discussed, although several cross both Campbell and Converse Counties. The pipelines are shown on Map 4, Energy Resources of the Eastern Powder River Coal Basin, in Volume V Appendices, but they are not discussed elsewhere except to say that the proposed railroad between Gillette and Douglas will cross pipelines in the Hilight oilfield area. It further states that those

Memo. to: State Director, Bureau of Land Management, Cheyenne, Wyoming,
Subj: Regional Analysis and Site Analysis, Development of Coal
Resources in the Eastern Powder River Coal Basin of Wyoming

pipelines will be protected. We believe that the text should briefly describe pipelines in the area, the effect of coal and rail development on them, and plans for their relocation or protection if necessary.

Volume II

Page I-679, 2d paragraph: We believe that the figure of 65 percent recovery from underground mines is a little high. In a sampling of 200 underground mines, it was found that the percentage of recovery rarely exceeded 60 percent and, depending on the type of mining used, was usually between 50 and 60 percent. We suggest that the 65 percent figure be modified to between 55 and 60 percent.

Page I-682, 2d paragraph: We believe that acid mine water, if produced at all, will be localized within a given mine or mines and is unlikely to be a serious problem.

Pages I-708 and I-743, Production from the Outer Continental Shelf: We believe that this section is much too long and detailed. In an environmental statement detailing the environmental impact of mining coal in the Powder River Basin, it is questionable, for example, that there is any parallel or direct relationship to oil wells and their effects on the shrimp catch in the Gulf of Mexico. Oil exploration and production will occur on the Outer Continental Shelf with or without development of Powder River Basin coal, and environmental effects in the Gulf or other offshore areas should not be injected to confuse an environmental statement on coal mining in Wyoming.

Page I-800, 1st full paragraph: The estimate of 47 billion tons of surface minable coal in the Rocky Mountain and Northern Great Plains provinces is far too conservative. Figures developed by the Northern Great Plains Work Group indicate that approximately 81 billion tons of coal is recoverable by surface mining methods in North Dakota, Montana, and Wyoming alone. Other Rocky Mountain States contain approximately 3.5 billion additional tons of coal recoverable by surface mining.

Page I-871, Lost Production: We believe that the information given on this page is misleading. It implies that the 16,600 acres of land, estimated to be permanently lost to livestock production, will result in the loss in production of a large number of animals. However, when calculated through, the 16,600 acres would support only about 250 AUM

Memo. to: State Director, Bureau of Land Management, Cheyenne, Wyoming,
Subj: Regional Analysis and Site Analysis, Development of Coal
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per year. Considering the alternatives of not mining the area to save it for livestock production, such numbers are minute. We suggest the page be revised to (1) define an AUM; (2) explain how many AUMs would be lost per year; and (3) indicate how many animals would be denied to the Nation by 1990. This procedure would bring the information into perspective and help show the relative value of mining versus livestock production in the area. Further, it is stated that the land used for roads, plantsites, and railroads will be permanently lost. However, we see no need to retain plants and roads once mining has been completed. Even powerplants have only a 35-year life expectancy. If the 16,600 acre figure is in fact correct, then it should be explained more fully.

VOLUME III

Page II-132: The only reference in the environmental statement to mined land reclamation for quarry sites and sand and gravel pits for road metal, fill, etc., appears here. In the section on mine sites (Vols. III and IV), no reference was made to rehabilitation of those areas that will supply baked shale (scoria) even though each description states that baked shale probably will be used as road metal. We suggest that a separate section be added indicating an awareness for the need for rehabilitation and discussing plans for reclaiming quarries and pits from which such road metal and fill will be taken.

Overall, we believe the descriptions of mining methods and rehabilitation covered in Volumes III and IV are adequate. However, we were unable to find a discussion of the possibility of using or marketing fly ash. The environmental statement notes that both bottom ash and fly ash will be buried in the mine. However, fly ash has several alternative uses. It is possible that some ash produced from powerplants in the area could be used for making cement, concrete, or concrete products, as construction fill and road base, and for soil stabilization. Other uses might be for the manufacture of bricks, as lightweight aggregate, and as a mineral filler in asphalt. Still other uses for fly ash have been demonstrated in oil well grouting, for foundry core sand, as a filler in plastics and chemicals, for blasting grit, and highway sanding. We suggest that a short section on the possible utilization of fly ash be added to the section on the Wyodak mine, Volume IV, pages IV-1 thru IV-171.

Acting

Director

The Wilderness Society + _____ 4260 E. Evans Avenue, Denver, Colorado 80222 _____
 Western Regional Office Phone (303) 758-2266

July 25, 1974

Mr. Daniel P. Baker, State Director
 Bureau of Land Management
 P.O. Box 1828
 Cheyenne, Wyoming 82001

Dear Mr. Baker:

Five million acres of land in two counties is a substantial and important area on the American continent. Before it is ravished and destroyed by stripmining, all possible alternatives should be researched, and a waiting period established in which to explore other methods of new technology that might alleviate detrimental consequences.

Entire ecosystems will feel the effects of stripmining in Wyoming and Montana. The costs of pollution -- loss of resources, cost of pollution abatement and control, and cost in human health and life -- extend beyond the logic of an intelligent society.

Every possible adverse environmental effect will be perpetrated upon this portion of our country. The scope of the project is gigantic, the consequences unending and horrendous for a wealthy nation to tolerate -- an embarrassing situation for us when viewed from a spaceship, an airplane, the ground -- or from the point-of-view of countries less developed than ours that have managed to live within the confines of their resources or from countries that already suffer the loss of their resources through centuries of negligence.

We will not set out our objections to stripmining on the basis of each environmental impact. Known impacts are well documented. We concur with and endorse the well-researched comments provided you by the Sierra Club's Northern Great Plains Office and the Wyoming Outdoor Council.

However, several matters warrant specific comment:

(a) Water problems resulting from the project primarily concern us because rivers that are hundreds of miles away will be drawn upon and will be essentially drained. Consequences are obvious.

(b) Air pollution resulting from the project is of equal concern, because not only does the local region tend to lose in its air quality, but areas miles away, such as Bighorn Canyon National Recreation Area and Devils Tower National Monument (areas of public use and interest), will feel the effects of stripmining. While the air quality declines in these

recreation and scenic areas, the people-use increases, contributing to an already worsening situation.

(c) At the present time, the success of reclamation projects is uncertain, according to Robert R. Curry, Associate Professor of Environmental Geology at the University of Montana. He says, "Since the weathering processes are so much slower than in the east, times for successful reclamation in the west are very long, and specialized land management must be practiced many decades to centuries at minimum. . . . When one considers the rising costs of western water and fertilizer and the rising values of maintained water quality, I estimate that costs of reclamation in the west are 10 to 100 times as great as those on steep, contour-stripped lands in the southeast. . . . We need very tight reclamation legislation specific to those portions of the U.S. with precipitation less than evaporation and we need it now."

(d) Climate modification is another area of broad concern, which could have synergistic effects on weather in other parts of the United States. This subject needs research.

One of the "Alternatives to the Proposed Action" listed third from the bottom on the list of 20 alternatives is "Energy Conservation." This important consideration which will necessarily affect the life-style of many Americans, was brushed off in a single ten-line paragraph (p. I-829). The paragraph only documents the demand for energy, and states that as population decreases, per capita demand will account for a larger share of energy. In other words, as long as the energy is available, we will amplify our modes of living to use all of this energy. The paragraph does not even suggest the meaning of its title, "conservation of energy." The Wilderness Society feels that this is the only answer to preservation of planet earth.

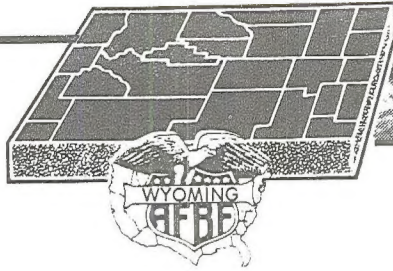
We would like to see realistic suggestions set out for all Americans to implement in their daily lives to reduce the need for energy consumption. We would like to see the admission that this is necessary, not such innane statements reiterating the fact that Americans use energy and the need for it will continue to grow in spite of a population decline.

Again, we stand behind environmental groups in Montana and Wyoming who oppose the devastation of stripmining in the East Powder River Basin. Please include the foregoing comments in the record of hearings considering this subject. Thank you.

Sincerely,


Clifton R. Merritt
Director of Field Services

State Office
406 So. 21st
Laramie, Wyoming 82070



"Wyoming's Largest Independent Agricultural Organization"

FARM BUREAU FEDERATION

P. O. Box 1348

Phone 745-4835

July 26, 1974

Mr. Dan Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wy 82001

Dear Dan:

On behalf of the Wyoming Farm Bureau Federation I wish to comment on the Draft Environmental Impact Statement, Regional Analysis, Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming. Since WFBF is a general agricultural organization representing all 23 county Farm Bureaus, we wonder why we were ignored as comment sources on this DEIS. This seems somewhat incongruous in light of being asked to comment on an informal impact statement concerning buffalo grazing on national resource lands. May we request that we be contacted for commentary on all BLM issues under public scrutiny. If the issue has limited scope we will refer it to the appropriate affiliate unit for review and comment.

After finally obtaining a set of the DEIS, we found it to be an overwhelming volume. It is disconcerting to learn that the BLM and other federal agencies comprising the drafting team will have required five months or 27 man-years for its completion. Yet the affected landowners and others were given only about 60 days to react to the multitude of comments contained in the report. How then could a rancher or farmer find the time, or possess the necessary expertise to evaluate the potential ramifications the DEIS poses for agriculture?

The DEIS raises some general questions concerning the competition between agriculture and industry for water rights. What will be the effects on agriculture from the proposed development? Considering the uncertainty surrounding the various potential developments, national strip mining legislation, and a myriad of research studies, how can any valid DEIS be prepared? Did the study team consider all the variables in preparing the DEIS, including those which might lend themselves to a more positive outcome? Isn't the DEIS inconsistent in predicting the effect of reclamation on mine lands? In regard to the latter, we doubt that conclusive evidence is available at this time on the reclamation of strip mine land in Campbell and Converse counties.

Through personal review, and the assistance of outside resource technicians, we offer the following observations:

Volume I, Chapter II page I 42 Paragraph 4

In the paragraph discussing the "outlook for the agricultural industry," it is noted that "the outlook for the agricultural industry ... is one of continuing deemphasis." Explain more fully what you mean by "continuing deemphasis."

Volume I, Chapter I page I 48 Paragraph 1

How many miles of prime all-weather paved roads will be built; will they be state or county maintained; and how many miles of improved gravel roads will be built? These roads may also benefit agriculturists.

Volume I, Chapter II page I 48 Paragraph 4Volume I, Chapter II page I 50, Lines 1-8

"Deep aquifers containing salty water not suitable for irrigation, or animal or human consumption are the proposed water sources." This implies that the State Statutes giving authority for the coal slurry line would have to use or contemplate using poor quality water.

Under Title 41, Chapter 2, Article 1, Paragraph 41-10.5 Wyoming Statutes, 1974 Interim Supplement, the only requirements regarding water are (1) "That the water to be used is underground water from the Madison or Bell Sand formations;" (2) "that such use will not interfere with domestic, municipal, stock watering or irrigation uses or other existing beneficial uses within Wyoming;" (3) "that the water is withdrawn from a source of supply located at a minimum of two thousand five hundred feet below the ground surface, from wells constructed to a depth of more than two thousand five hundred feet beneath the ground surface," etc. Nothing in the statutes restricts or implies that the water is to be unfit for human consumption. Parts of the statute should be so quoted so as not to mislead the reviewer.

Volume I, Chapter II page I 52 Paragraph 1

In the paragraph discussing water quantity it is stated that "Sources of water to meet these needs could be provided from available and unused ground and surface water or by transfer from present uses (irrigation, etc.)" Are you advocating the use of water right transfers and the use of unused shallow underground water?

Water right transfers and the use of unused shallow underground water should be a last resort. If there are surplus surface waters or water from sewage treatment plants that is useable, then this should be used first. Industry can better afford the expensive deep underground water than can agriculture, and the transfer of water rights should only be a last resort as water taken from agricultural use creates economic problems in that sector.

Volume I, Chapter II page I 59 Item 6

The proposed guidelines for reclamation scheduling to restore to live-stock grazing use indicates a minimum of two years to re-vegetate the spoil and mined areas. Erosion of these areas as well as controlling weeds could become a very serious problem. Appropriate seeding and other control measures should be undertaken.

Volume I, Chapter II, page I 59 Item 7

It is stated there will be a 50% loss in productivity for grazing purposes even if the entire area is re-vegetated. Identify the supporting data for the use of 50%. It is impossible to evaluate the effects upon development and grazing use after reclamation without presenting the basis for deciding a 50% loss in productivity.

Volume I, Chapter II page I 79 Paragraph 2 Sentences 5, 6, 7, & 8

Based on the assumption that the best technology will be applied, an estimated 70 to 80 percent of the mined land surface would be expected to be successfully rehabilitated under existing climatic and soil conditions. Why only 70-80% of the mined lands may be successfully rehabilitated? Is this figure conducive to the area in question? Identify the basis for using this percentage.

Volume I, Chapter IV page I 79 Paragraphs 1 & 2

Statements declaring that rehabilitation techniques to include the re-establishment of vegetation have not been successful to reach a near climax are misleading and incorrect. To date, there are over eleven test plots and reclaimed areas within Wyoming which have shown successful results in techniques of reclamation. When properly applied, reclaimed lands can produce a near climax vegetative condition and also surpass present climax conditions in vegetative types.

These paragraphs should be supplemented with statements reporting the results and efforts already attempted to reclaim strip mined lands.

Volume I, Chapter IV page I 326 Paragraph 2

The paragraph on coyotes is not accurate since coyotes take a toll on a great many sheep and on the wildlife when domestic livestock are not available. A Draft Environmental Statement of February 8, 1972, U. S. Bureau of Sport Fisheries and Wildlife, USDI, indicated 80% of the predators taken by toxicants and 20% by trapping, denning, and shooting. As toxicants are not being used now, it would seem that four times as many would have to be taken by the methods (trapping, denning, and shooting) as were taken (pre-February 1972). The information in this section should be substantiated or deleted.

Data prepared by the U. S. Bureau of Sport Fisheries and Wildlife refutes, rather than supports, that coyote population acts to "check" rodent population. Therefore, this statement in the E.I.S should be substantiated or deleted. In addition, the U. S. Bureau of Sport Fisheries and Wildlife will not support the contention that coyote population fluctuates with

rabbit and rodent population; therefore, we suggest substantiation or deletion.

Density calculations should be included for all wildlife species. Dr. Dan Balser and Fred Knowlton, U. S. Bureau of Sport Fisheries and Wildlife researchers, have data which should clarify these issues.

Predator control is one of Wyoming agriculture's biggest problems and is forcing many woolgrowers out of business. The paragraph would be better worded that "sheep numbers are declining due to predator problems. When domestic livestock are not present, coyotes will have an effect on the deer and antelope population."

Volume I, Chapter IV page I 370 Paragraph 1
Volume I, Chapter IV page 371 Lines 1-6

The cattle and calf numbers are not quite accurate and the initial source of all livestock statistical information is the Wyoming Cooperative Crop and Livestock Reporting Service.

Campbell County dropped in cattle and calf numbers to 60,600 in 1962. Stock Sheep numbers have been declining. However, in 1964 Campbell County showed 176,000 head for a high and a low of 89,000 head in 1950, while Converse County showed a high of 135,900 head in 1958, and a low of 104,000 head in 1950. We request that these calculations be considered in determining if sheep numbers are declining.

Volume II, Chapter V page I 469 Paragraph 3

As noted in Volume I, page I 48, we question what types of roads these will be. Are they prime, gravel, dirt, etc? State the types of roads, mention miles of each, and location.

Volume II, Chapter V page I 498 Line 1

Why does it appear "that Green River water will be the only water imported?"

State why Platte River, Yellowstone River, Yellowtail Reservoir, or Big Horn River water won't be used, instead of Green River water. This comment has been mentioned several times and mention of other water importation projects is not made. The Bureau of Reclamation has done an aqueduct study for the study area and the Green River was an alternative as were the other rivers.

Volume II, Chapter V page I 501 Paragraph 4

The story is not that "coal development could impact present water rights and unappropriated water amounts" but that it will have a decided impact. Companies who purchase the land for the water are doing a

disservice to agriculture.

Companies who wish to purchase water rights should be urged to find unappropriated water, and it may be necessary for the state to mandate that agricultural water must stay with the land. The state should also urge the companies to lease back to the landowner the land and water until such time as it is needed, or for the companies to farm the land themselves.

Volume II, Chapter V page I 526 Paragraph 2

"Collision hazards...are certain to increase." A statement of fact is made without any statistics to back it up. The inference is "quite a number". Do you have any facts or figures to back this up?

Volume II, Chapter V page I 527 Paragraph 2

The statement "Such disturbances can lead in time to increases in coyote predation on livestock and game species favored by man" is a misstatement. Coyotes are already preying on livestock and wildlife. In some southwestern states coyotes are invading the cities and becoming aggressive. We also note that the black footed ferret can be adversely affected by losses of prairie dog colonies. Does the black footed ferret presently exist in the area?

Previously it was stated that coyote (and other predator) population fluctuates with prey species. Now a reduction in prey results in a coyote build up. Which hypothesis can be substantiated? We request a copy of that substantiation. Dr. Balser and Fred Knowlton, U. S. Bureau of Sport Fisheries and Wildlife Researchers, should be asked to provide data.

Volume II, Chapter V page I 528 Paragraph 1

The statement "Much of this water maintains a fish and wildlife habitat base on irrigated meadows,..." is a little fanciful. There is fishing in the Powder River Basin, but fishing in the ditches and dry streams seems a little far-fetched. We also note a figure of 1.5 million acre-feet is used which has increased $\frac{1}{2}$ million acre-feet in 27 pages. The density of wildlife on meadows is necessary to substantiate the claims made. Fishing can be done on the reservoirs and where the streams are live, but to make it sound as if fishing abounds all over the irrigated areas is a bit untrue.

We would also like to know whether the figure 1 million or 1.5 million acre-feet is the correct amount filed with the State Engineer for change in use.

Volume II, Chapter V page I 539 Paragraph 1

In the fourth sentence 1.5 million acre-feet is the figure used as the amount of water that has been requested to be changed from agricultural to industrial uses. Is this the correct figure? Whether the 1.5 million acre-feet is wrong or the 1 million acre-feet is wrong on page 501, paragraph 4, Volume II, Chapter V, these two figures should agree.

Volume II, Chapter V page I 539 Paragraph 3

It is stated that the sand, gravel and clinker material may be mined from stream courses and this will impact scenic recreation lands. Are these stream beds and limestone outcrops really as scenic as the DEIS would have people believe? "Scenic" is nebulous unless quantified. What scale is being used?

It does not seem quite accurate that sightseeing in some of these remote areas is as important as implied. Much of this country is private and therefore, little sightseeing occurs, and since many of these streams are intermittent, it does not seem as though the recreation impact would be very great.

Please refer to Volume II, Chapter V, page I 537 Paragraph 2. A recreation use of 10.87 acres per visitor day is not heavy use compared to Yellowstone and other areas.

Volume II, Chapter V page I 542 Paragraph 3

It is stated that "0.6 percent of agricultural land will be disturbed and lost to production by 1990," but it fails to state what is produced on this land and then it is stated that "the permanent loss is not a significant regional loss...". On what basis are these facts stated? Tell what the production is on these lands and what is grown there. The second statement appears to be a biased judgment and would appear to be opinion rather than fact.

Volume II, Chapter V page I 543 Paragraph 1

In sentences 6 and 7 it states that molestation of grazing animals is expected to increase. Are there any facts and figures to back up this statement? If it is happening now, what is the occurrence? Also, if grazing animals are molested, won't wildlife have a problem also?

Volume II, Chapter V page I 543 Paragraph 2

In the statement "Construction of railroads, highways, and service roads..." we would agree that there would be some management problems, but how many miles of roads do you anticipate? State the total mileage of all types of roads.

Volume II, Chapter V page I 545 Paragraph 2

DEIS discusses loss of livestock watering facilities and the high cost of replacement wells, etc. Isn't it probable that the coal companies will have made arrangements with the various ranchers to help alleviate this situation prior to beginning operations? Hopefully, the coal companies will want to get along with the rancher and it should be part of the agreement if it isn't already, that if facilities dry up, then the companies will replace them.

Volume II, Chapter V page I 545 Paragraph 4

Under the heading of "farming" is mentioned the loss of nonirrigated production. County averages are used to prove a point. Isn't it correct that in many of the disturbed areas that little or no actual production occurs? That is to say, just because crops are grown on dryland in the county, this doesn't mean to say that in the mine areas that crop production is practiced. DEIS should state or map the localities of actual production and overlay them on the mine sites.

Volume II, Chapter V page I 546 Paragraph 1

DEIS begins by estimating that a quantity of nonirrigated cropland (hay and wheat) will be removed from production. Isn't it possible that the mining companies in their reclamation of these lands will add some wheat and hay land? It would also be interesting to find out what is actually produced on these lands now.

Volume II, Chapter V page I 546 Paragraph 2Volume II, Chapter V page I 546 Paragraph 3

Various impacts are anticipated regarding loss of irrigated cropland; however, if mapping or surveying were done in this area, would DEIS facts hold up?

Volume II, Chapter V page I 547 Paragraph 1

In the fourth sentence it states that "Irrigation water is the major supply available to industry...." Major implies that it is in the greatest abundance; however, isn't it possible that deep underground water and surplus surface waters are in even greater abundance? Industry should be encouraged to explore for deep underground water and to use surplus surface waters before agricultural purchases are contemplated.

Volume II, Chapter V page I 547 Paragraph 3

Under the heading "Summary" it states "the direct loss of agricultural land and production by 1990 would not constitute an important regional impact as lost production by that time is anticipated to represent one percent or less of the total regional agricultural production." On whose authority will this production not be important? What is meant by "not constitute an important regional impact?" Please identify the "region".

Volume II, Chapter V page I 548 Paragraph 1

From whose standpoint is a 6 percent loss of irrigation water not considered a significant impact? We contend that a 6 percent loss is significant. If we assume 6 percent of the nation's energy may be developed in the Basin, is that 6 percent significant? We would prefer to leave irrigation water alone and develop deep underground and surplus waters.

Volume II, Chapter VII page I 653 Paragraph 5

The statement is true as long as irrigation water is the only water used. "Adverse, unavoidable impact" are pretty strong terms and the whole process could be partly avoided if surplus surface waters and deep underground waters were used. Urge and encourage companies to build reservoirs to store surplus surface waters and drill deep underground wells to lessen the impact on agriculture.

Volume II, Chapter VII page I 662 Paragraph 5

Does DEIS have facts and figures to back up this figure of irrigated cropland loss of 31,473 acres? Are the acres that are going to be mined presently irrigated? Is it not possible for agriculture and industry to share some of the water? Without adequate surveys of the areas now, we really don't have any idea of what is now being produced or what will be lost. An adequate land survey of the several mine areas is necessary.

Volume II, Chapter VIII page I 688 Paragraph 1

"Rehabilitation of lands solely for grazing purposes would impact and limit other land uses" is an extreme statement since DEIS fails to comment that what is out there is primarily grazing land, private land not necessarily seen by the sightseer, but hunted on by the sportsman. And grazing land certainly adds to the aesthetics, to the economy, and to wildlife. Does DEIS have proof that this rehabilitation will "impact and limit other land uses?"

For years we have worked under the multiple use concept. We're concerned with good rehabilitation for all uses, not for single uses but multiple uses. Secondly, it may or may not be company land and that may also dictate what the rehabilitation will be. No one, however, has ever argued over good grass.

Volume II, Chapter VIII page I 689 Lines 3 and 4

The statement "Sagebrush seeding would be highly desirable along with other plant varieties," is anathema to us. Why plant sagebrush once you've gotten rid of it? As a matter of fact, it will grow back without your seeding help. Plant species by percentage must be identified on lands under present use. We suggest you do not reseed sagebrush, once rid of it. You'll find better soil moisture and better multiple use of the area by all concerned. Use the University of Wyoming Weed Specialist's opinions and thoughts before any planting is done.

Volume II, Chapter VIII page I 689 Paragraph 1

Why design "Water impoundments...specifically for wildlife habitat?" Are wildlife the sole users of this land now? Please refer to inconsistent statement on Page I 688, Paragraph 1, Volume II, Chapter VIII, i.e., single use assumptions. The multiple use concept is the only concept that should be used and designing things specifically for one use should be discouraged. Secondly, wildlife aren't the only users of the area now.

Volume II, Chapter VIII page I 690 Paragraph 3

Why would "Water impounded for recreation use be unavailable to industry, agriculture, and other uses?" Refer to previous "single use" concept comments.

Volume II, Chapter VIII page I 691 Paragraph 1

Under the heading "Impacts" it is stated that "...average yields uneconomical unless irrigation is available...Recreation use would be eliminated...Livestock grazing would be limited to specific seasons...Economic and local demand for farm products would bear directly on this alternative." Why would all these occur if the areas were returned to cropland? Reasons for making these assumptions should be clearly stated.

The multiple use concept should prevail; however, some rehabilitated areas will be returned to their present uses, probably grazing and this can be productive. In other areas, cropland can be a new use for this area where there was little or nothing.

Volume II, Chapter IX page I 861 Paragraph 1

In the third sentence DEIS states that "Long term productivity of this land will be lowered by 50 percent, or 2,600 animal unit months per year." Why and who is the source of this assertion?

Volume II, Chapter X page I 871 Paragraph 4

The statement "By 1990, an estimated total of 9,500 acres will have been irreversibly and irretrievably committed to uses other than presently exist on the land," needs explanation, as do the other two sentences,

Mr. Dan Baker

July 26, 1974


page 10

"This change will mean a permanent loss of wildlife habitat and grazing land. Displacement of all animal species from this land will occur," is another speculative statement. What is planned with this 9,500 acres? Does DEIS mean that there will be no animal species at all on this 9,500 acres? Substantiation is needed.

In conclusion, we reiterate our concern over the volume of material in the DEIS and request that the BLM grant an extension of time for comments to perhaps October 1, 1974. Such an extension could be used to better evaluate the report while at the same time the study team could re-analyze other valuable information on groundwater and reclamation techniques.

Thanks for the opportunity to comment on DEIS. In the future, we hope that the BLM will consider the Wyoming Farm Bureau Federation as a regular source from which to solicit comments on these and other appropriate subjects.

Sincerely yours,



Herbert F. Manig, CAE
Executive Vice President

cc: Senator McGee
Senator Hansen
Representative Roncalio

TEXAS UTILITIES SERVICES INC.

1506 COMMERCE STREET • DALLAS, TEXAS 75201

PERRY G. BRITTAIN
PRESIDENT

July 22, 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Comments on
Draft Environmental Impact Statement
Development of Coal Resources
Eastern Powder River Coal Basin
of Wyoming

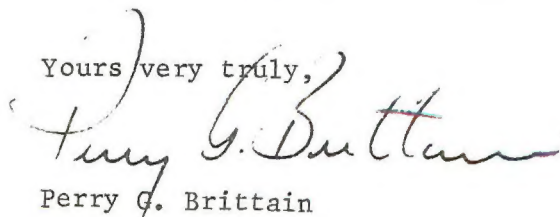
Dear Mr. Baker:

We have examined the five (5) volume "Draft Environmental Impact Statement" prepared by the Inter-Agency Team on the Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming. The study includes most of the matters that would affect the ecology of the region, both environmental and economic.

Based on our company's own experience in open-cut mining, land reclamation and burning low rank coals, we are of the opinion that technology exists to strip mine coal (including land reclamation), transport coal to point of use (by rail or slurry pipeline) then burn the coal in large, central generating stations (that are equipped to meet Federal ambient air quality standards and Federal water quality standards) and thus produce electric energy to meet the requirements of our nation. This contribution of energy for our fuel short future should be fully included in your benefit/cost analysis of the impacts of this development.

The area under study encompasses about 5,000,000 acres. Surely, with the cooperation of the five Inter-Agency Groups and the several private companies interested in the development, a regional sequence of mining plan can be developed that would minimize the area(s) under development at any one time and thereby minimize the percentage of the large region that was being impacted at any point in time. For example, 50% of the total region could be mined in a 50 year period with only 1% of the total area under development in any year.

Yours very truly,



Perry G. Brittain

PGB:cwk

THE UNIVERSITY OF WYOMING

DEPARTMENT OF GEOLOGY

GEOLOGY BUILDING

P. O. BOX 3006

LARAMIE, WYOMING 82071

PH. 307—766-3386

July 22, 1974

Robert Browne
Team Leader for Environmental
Impact Statement
Box 1828
Cheyenne, WY 82001

Dear Mr. Browne:

At the request of Dr. James Tate of ARCO, I am sending you a copy of our May 6 progress report on our environmental study of the Black Thunder site. We are currently finishing our analytical work on this project, and we have a great deal more data than is contained in this report. I am now attempting to compile these data, and I hope I shall be able to send them to you by the end of next week.

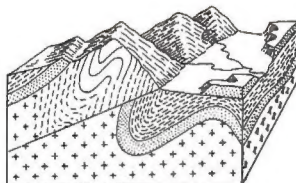
I also enclose a few comments we have on the preliminary EIS.

Sincerely yours,

James I. Drever,

for J. I. Drever,
R. C. Surdam and
J. W. Murphy, Geo-
chemistry Component
of Black Thunder
Project.

JID/tc
cc: Dr. James Tate
Atlantic Richfield Co.
Enclosures



COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT ON DEVELOPMENT OF COAL RESOURCES IN THE EASTERN POWDER RIVER BASIN - J. I. Drever, R. C. Surdam, J. W. Murphy, and D. A. Copeland (Geochemical Component of Black Thunder Project)

1) We take exception to the statement (p. III-12) "Preliminary tests indicate the overburden does not contain any toxic materials". This impact statement (P. III-45) indicates potential problems with respect to boron and lead; our own analyses have shown local high concentrations of molybdenum, beryllium, and cadmium, and the botanical component has reported the presence of selenium converter plants, indicating a possible selenium problem. The local high concentrations of these elements appear quite sporadic in occurrence. We believe that many more analyses of the overburden should be made, so that areas with high concentrations of toxic elements can be located, and measures can be taken to prevent these elements from being released to the environment. We note that in ARCo's current drilling program the overburden is being discarded and not retained for analysis.

Since toxic elements may be leached from the disturbed overburden, we strongly recommend that trace element concentrations be monitored in ground waters surrounding the site, and in surface waters downstream from the site.

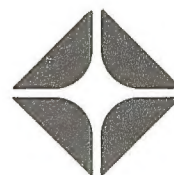
2) The impact statement (e.g. p. III-108) does not really make the point that pumping water from the pit into Little Thunder Creek will raise the salinity of the creek, and will probably make the water downstream from the mine unsuitable for livestock and wildlife use. This is a relatively minor and local problem when the ARCo mine is considered in isolation, but the

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cumulative effect of all the proposed operations in the region on surface water quality could be very significant. We think this question should be discussed in more detail in the impact statement. Also, since ARCo has many analyses of ground waters from the coal and overburden (the waters which will probably be pumped from the pit), we think the impact statement should include a tabulation of these analyses.

3) On p. III-30 it is stated that irrigation will be used, if necessary, to re-establish vegetation, but the proposed source of irrigation water is not mentioned. In view of its salinity and sodium content, the suitability of the local ground water for irrigation is questionable. Whether or not the water is completely unuseable is outside our field of competence. We believe the impact statement should be more specific as to the feasibility of irrigation, particularly since irrigation is likely to be needed only in the event of a general drought, at which time other demands for water will be high, and supplies will be at a minimum.

4) Although it is completely unrelated to our work on the Black Thunder Project, we think the impact statement should discuss the problem of acid rain resulting from SO_2 release from generating plants and gasification plants. A recent article in Science (v. 184, p. 1176-1179, June 14, 1974) documents that acid rain is a serious environmental problem in the northeast U.S. It is very possible that it may become a problem downwind from generating plants in Wyoming.



July 26, 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
Wyoming State Office
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

We at Atlantic Richfield compliment all those in the various governmental agencies who were involved in the preparation of the Draft Environmental Impact Statement, Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming. It was a difficult job well done. The document speaks adequately, and in some cases more than adequately, to the various problems which will arise as the result of coal development in the Eastern Powder River Basin. There are some areas of the document, however, which we feel need to be clarified, or even corrected, in order to place the impacts of coal development in their proper perspective. The areas of major concern to us are addressed below.

Rehabilitation Concerns

First, we are concerned with some statements relative to rehabilitation, especially the assumption made in the Analysis Guidelines, Vol. I, p. I-59: "7. There will be a 50% loss in productivity for grazing purposes. This will occur even if the entire area is revegetated." We believe the authors of the Draft E.I.S. may be confusing some of the ecological information contained in other volumes of the E.I.S. and call your attention to the following.

Although the term "productivity" is not defined in the Glossary, Vol. V., Appendix B, pp. B-1 -- B-9, we assume from the context in which the word appears throughout the E.I.S. that it is being used in a range management sense, i.e. the amount of edible material for domestic cattle produced per unit of ground surface. This is, of course, not the total productivity of the system.

Mr. Daniel P. Baker

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Many other products of green plant photosynthesis are utilized by other organisms.

Somehow "productivity" and plant "cover" seem to have been confused in the E.I.S. For example, in Vol. V, p. C-41, in a discussion of plant succession on abandoned farms, the statement is made that 9 years after abandonment the ... "cover was less than 50 percent of that found on adjacent undisturbed lands." and that on lands abandoned between 40-45 years ago the... "total vegetative cover still averages about 43 percent less than average total cover on adjacent undisturbed rangeland."; in Vol. V, p. C-42, "After almost five years, reseeded pipeline rights-of-way on the A.R.Co. coal lease had an average of over 60 percent less vegetative cover directly over the pipeline, where soil was deeply disturbed, than the average on adjacent rangelands."; and in Vol. V, p. C-43, "The total vegetative cover will be greatly reduced, probably near 50 percent of that found on adjacent undisturbed range."

Could these statements be the source of the Vol. I, p. I-59 assumption of 50% loss in productivity? There seem to be no data presented in the E.I.S. to substantiate the loss in productivity assertions. Please refer to Chapter IX pp. 38-56 in Enclosure I for clarification of data on vegetative recovery on disturbed soils at Black Thunder.

A plant community could have almost 100% cover, e.g. the canopy coverage of a forest, and still produce so little food for cattle that none could survive there. It seems desirable, therefore, to make the distinction between loss of cover and loss of productivity in the Powder River Basin studies.

If rehabilitation efforts are successful on the disturbed surfaces, it may be possible to increase productivity over that of today's grassland which is filled with woody perennials and herbaceous annuals of low palatability to livestock. In so doing, the basal area coverage of the vegetation may decrease, but the value of the grassland for grazing of livestock will increase.

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Socio-economic Concerns

A second major concern to us is the treatment of the socio-economic aspects of the proposed developments. It is our opinion that the mitigatory measures being undertaken by the companies planning operations in the Powder River Basin are not discussed in sufficient depth in the Draft E.I.S. to inform citizens of the extent and depth of the companies' involvement in planning for a continuation of a high quality life style for residents of northeastern Wyoming.

Ways in which company representatives and local citizens are attempting to solve the problems which will arise as workers and their families move into the area are discussed in Enclosure II, "Efforts to Mitigate Adverse Social and Economic Impacts due to Coal Development, Campbell and Converse Counties".

We recognize that mining and industrialization of sites in the northern Great Plains is anathema to residents who wish to retain a rural, open-life style. By the actions described in Enclosure II, we are attempting to retain this latter quality of life insofar as possible, as industrialization develops.

Alternatives

Next, the adverse impacts of several of the alternatives to the proposed action were not adequately evaluated in this draft. Specifically, we refer to the alternatives which would prevent or seriously restrict the development of the coal deposit. The nation needs this coal, and there are certain environmental benefits to be gained through its use. We have asked our customers--those who will use this coal--to respond to this particular concern.

Revised Mining and Reclamation Plan

Our fourth concern is that Part III, "Analyses of Proposed Mining and Reclamation by Atlantic Richfield Company" does not properly incorporate the mining and reclamation actions we proposed to take at Black Thunder. The reason for this is obvious.

Mr. Daniel P. Baker
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Our "Revised Mining and Reclamation Plan for the Proposed Black Thunder Coal Mine", dated May 20, 1974, was not submitted to you and other governmental personnel until June 10. The mine plan described in the Draft E.I.S. is generally correct, but our reclamation proposals, particularly as they pertain to reclaimed land forms and rehabilitation techniques, have been completely updated, so that the statements made in the draft E.I.S. on these subjects are obsolete. Also, many of the actions we propose in order to mitigate possible adverse impacts are not discussed. Anyone reading our revised plan should become aware of our environmental concerns as they relate to surface mining in the Powder River Basin.

We are submitting with this letter as Enclosure III, a copy of Part III of the draft E.I.S. on which we have shown suggested changes. This enclosure is meant to be an aid in the updating of Part III. We are also submitting, as Enclosure IV, an assessment of our proposed operation along with additional environmental data.

Weather Modification

A fifth area of concern arises as the result of statements made at the public hearings on the Draft E.I.S. concerning the possibility of major weather modifications across the northern Great Plains resulting from industrialization in the Powder River Basin. Comments made to us lead us to believe that the statements made by Drs. Richard A. Dirks and John D. Marwitz of the Department of Atmospheric Resources, University of Wyoming, were misunderstood by both the press and the public. To clear up any misunderstanding, as well as for completeness, we believe that the question of possible weather modification should be fully assessed in the Final Statement. Additional input from the two researchers named above is found in Enclosure I.

All mine and plant managers are fully aware of air quality standards which must be met in their operations and assuredly the companies planning developments in the Powder River Basin will install suitable air control devices and procedures. Dust, a natural pollutant of importance in climatic

Mr. Daniel P. Baker
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modification, will be controlled from all mining and trucking operations. The acreage of raw, exposed soil will be minimal in all operations, not only to control wind-blown dust, but also to reduce soil erosion from running water.

In short, we believe that although the speculations of major climatic modification may be theoretically possible, from a practical standpoint such changes will not take place because of the controls on pollution to be exercised by all operators.

Segregation of Impacts

Lastly, we believe it would be desirable if, throughout the statement, the impacts of surface mining were separated from the impacts of other coal-related developments, such as power plants. This would enable the public to put the different types of proposed operations into proper perspective.

There are specific statements in the Draft E.I.S. which we feel need to be corrected, or further considered. These we list in an attachment to this letter.

As an aid in the preparation of the Final E.I.S., we are enclosing with this letter certain reports, maps and statements. These enclosures are as follows:

- ENCLOSURE I - "Progress Report, Environmental Impact Study", Wyoming Environmental Institute-- July 1974.
- ENCLOSURE II - "Efforts to Mitigate Adverse Social and Economic Impacts Due to Coal Development, Campbell and Converse Counties".
- ENCLOSURE III - "Draft E.I.S., Part III, with changes and corrections resulting from extensive changes in Atlantic Richfield's Mining Plan.

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Mr. Daniel P. Baker
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- ENCLOSURE IV - "Preliminary Environmental Impact Assessment, Black Thunder Coal Mine", Woodward-Envicon, Inc.
- ENCLOSURE V - Map, Black Thunder Mine, showing access road, railroad, and power route.
- ENCLOSURE VI - U. S. Fish and Wildlife Service Breeding Bird Surveys; Bill, Wyarno, and Clarkelen, Wyoming

Very truly yours,



Frederick R. Scheerer
Environmental & Public Affairs Supervisor

FRS:sz

Attachments

cc: John Allingham

Editing Inconsistencies in Draft

- 1) Use of ARCO for Atlantic Richfield Company. The term ARCO is used throughout these five volumes to identify the Atlantic Richfield Company. ARCO is a trademark used for gasoline and petroleum products sold by Atlantic Richfield Company and its dealers. ARCO is not used in legal instruments as a designation or abbreviation for Atlantic Richfield Company. Abbreviations of Atlantic Richfield Company that are sometimes used in legal instruments are A.R.Co., Atlantic Richfield or Atlantic.
- 2) Use of clinker, scoria, shale, porcelanite, etc. for natural baked shale. The Glossary does not clear up the matter (see Comment I-78).
- 3) Use of Roland, Roland-Smith, Wyodak, Wyodak (Roland) to identify the Roland coal seam.
- 4) Use of Pronghorn Antelope, antelope, etc. for the pronghorn. Pronghorn is the designated common name of this North American species. It is not a true antelope.

NOTE: Paragraph 1 is the first new paragraph on any given page.

VOLUME I

- i-1 Summary 3-I There will be considerable change in wildlife habitats because the final revegetated surfaces will be changed, but they will still support life. Some populations of wildlife will be reduced but some will increase. Substitute: "Wildlife habitats will be altered and populations will respond to the new situation--some species increasing and some decreasing".
- I-17, Paragraph 1
Line 7 There is no Pacific Power and Light lease block at this location.
- I-51, Paragraph 2,
Line 3 It is Atlantic Richfield Company's understanding this 230 KV transmission line will be in service prior to 1978. This will be necessary if we are to maintain the production levels proposed.
- I-59, Guideline 7 Loss of 50% of grazing productivity considered erroneous--See cover letter and comments on Volume V, Appendix C, page 41-43.
- I-78 and elsewhere
in the Report The terms "scoria, clinker and shale" are used. For the sake of accuracy a proper term should be agreed upon for the baked clay and shale overlying burned-out coal seams. It is suggested only one term be used consistently throughout the report.
- I-79, Paragraph 2
and elsewhere in
the Report A statement should be included in the "Assumptions and Analyses Guidelines" to the effect that is is assumed any impacts lasting over 30 years are permanent.
- I-86, Paragraph 4
Line 4 Not all coal will be stored in silos. Other types of facilities will be used.
- I-94 The section on coal gasification deals with only the Lurgi process since it is "the only method currently being considered for large-scale use". Other potential processing techniques should at least be mentioned.
- I-121, Paragraph 5 Wind roses from the Moorcroft Weather Station (Enclosure IV, Page) indicate that prevailing winds are not westerly.
- I-124, Paragraph 1
Line 2 The averaging of annual wind data would support this point. By choosing representative days or months this statement will probably turn out to be not correct.

I-285, Paragraph 1 This should read: "George Zeimens, Assistant
2nd Sentence State Archeologist, has identified six sites on the Black Thunder lease area, two of which are being considered for salvage." (See Wyoming Environmental Institute report, July 1974--Enclosure I).

I-337 Shore Birds and Song Birds. This treatment could be dealt with by habitats and be much more meaningful. See Vegetation I-268-277 and Chapter V, Table 11. Enclosure VI, Breeding Bird Surveys might provide some useful information for this segment.

I-344 Invertebrates. Insect studies have to deal at a smaller taxonomic unit than family to be meaningful. Some species warrant specific studies due to their abundance and impact.

VOLUME II

I-461, Paragraph 1 Given reasonable controls, dispersal of the sources of pollutants could be considered an advantage.

I-463 and I-466 Prevailing wind is not northwesterly (See comments I-121).

I-468, Paragraph 1 References should be made to appropriate comparative data so that the reader can make an intelligible evaluation.

I-471 & I-472 Section on topography should be expanded to include other types of surface mining (See Revised Mining and Reclamation Plan for the Black Thunder Coal Mine--May 20, 1974).

I-475, Paragraph 1 Atlantic Richfield Company plans to preserve the identity of topsoil types in their reclamation and we believe others have similar plans.

I-477, Paragraph 1 There is a real possibility that soil productivity
Line 2 & can be improved by proper management.
Paragraph 3, Line 2

I-504, Paragraph 2 How does this correlate to the 20% to 30%
Line 3 mentioned in Volume I? What is the basis for this figure?

- I-518, Paragraph 1
Line 10 Suggest change in wording to:...."in a change inspecies composition and numbers that would be considered undesirable by many.
- I-518, Paragraph 2 Complete loss of 300 head of elk does not seem reasonable because all elk range shown on Map 9 is beyond the area directly impacted by mining activities.
- I-521, Paragraph 1 The figures presented mislead the reader as to the impact. (Page I-650 says that 14,000 acres is only 0.3% of the study area).
- I-522, Table 11
Group I See Enclosure VI Breeding Bird Surveys. What is a Wright's Flycatcher? (Empidomax wrightii= Gray flycatcher)
- Group VIII A Snipe is a Sandpiper. "Avocet" misspelled.
- I-523, Paragraph 2
1st Indent For comments on the 50% reduction of vegetative cover, refer to major comments.
- 2nd Indent The Atlantic Richfield Company plans to re-establish the shrub component through the transfer of shrub pads.
- 3rd Indent We believe that there is a good possibility re-established plant communities will improve rather than deteriorate in terms of productivity and species diversity. Poor land use practices would result in a deterioration in existing as well as re-established vegetative cover.
- I-533, Paragraph 2 The Morning Dove responds readily to changes in land use. A preliminary analysis of U. S. Fish and Wildlife Service Breeding Bird Surveys for the Powder River Basin is enclosed. While a detailed anlysis of these data is anticipated, this preliminary analysis is included for the benefit of the writing team (Enclosure VI).
- I-570 Housing. It might be useful to the reader to know that vacancy rates were not considered in this discussion because of the low level of vacancy rates in Campbell County. More recent information on housing can be found in the Preliminary Environmental Impact Assessment on the Black Thunder Coal Mine (Enclosure IV).

- I-612 One or more lines appear to be missing at the bottom of the page.
- I-642 The section on land use planning, zoning and controls fails to address the extensive program being undertaken to mitigate the impact of the people influx into the area. These specific actions are described in Enclosure II, "Efforts to Mitigate Adverse Social and Economic Impacts Due to Coal Development, Campbell and Converse Counties, Wyoming".
- I-642, Paragraph 2 The suggestion that mineral development be controlled by county planning and zoning would be detrimental to society as a whole for influences of mineral development extend far beyond the county, and in some cases, may be vital to the nation.
- I-659, Paragraph 3 Refer to comments on I-518, Paragraph 2.
- I-664, Paragraph 3
Line 7 The loss of labor from the agricultural industry is not necessarily a result of coal development. Agriculture is losing labor worldwide.
- I-665, Paragraph 1 Housing. It is true that sufficient permanent housing may not be immediately available but this does not necessarily mean that the populations would have to accept inferior quality housing in that there are extensive development plans for first-class housing developments and mobile home parks.
- I-666, Line 1 Education. This assumes the highly unlikely event that no additional teachers will be hired between now and 1990.
- I-666, Line 2 Health and social services. This assumes that no physicians, dentists, professional nurses or other social workers can or will be recruited to the area. This is not the case since Campbell County is already actively attracting and recruiting new physicians. Quality of health care may actually improve.
- I-667, Paragraph 1
Line 2 This assumes no additional personnel will be recruited on the police force. This is not a reasonable assumption.

- I-667, Paragraph 4
Line 1 Correct, if the word "current" is placed at the beginning of the sentence. This assumes no expansion of the existing water and sewer facilities.
- I-669 thru I-675 The impacts of preventing or slowing coal development have to be fully assessed for their possible adverse effects on other segments of society. See concerns expressed in letter and comment on I-642, Paragraph 2.
- I-669 Administrative management of areas to be mined is an alternative that is being considered in detail in the Federal Coal Leasing Environmental Impact Statement. Should it be considered here as well?
- I-691, Paragraph 3
1st Sentence Reclaimed spoil would most likely be unstable as a base for foundations. Therefore, without preplanning these areas could not be used for urban and commercial development.
- I-702 The adverse impacts of government entering into a business venture are not discussed.
- I-707 Oil shale development is not discussed as an alternate energy source.
- I-859, Paragraph 2
Last Sentence Miners will become part of a long-term stable population and although new population will no doubt bring in a new set of values, they will not be those normally associated with a transient labor population.
- I-862, Line 4 There is no reason to believe the better soils will be buried in reclamation practices.
- I-863, Paragraph 3
Line 6 There are fewer than 50 elk in the vicinity of the Atlantic Richfield and Kerr-McGee leases. See III-84, Paragraph 2. These elk generally stay to the east of the lease sites.
- I-868, Paragraph 2 We have seen no evidence to suggest the possibility of subsidence due to groundwater production from the various aquifers on the eastern Powder River Basin. This paragraph should be justified.

I-873, Paragraph 2 Mining activities described in Parts III, IV, V, and VI differ appreciably from current strip mining operations in the east. It does not seem reasonable to predict numbers of disabling injuries and deaths based on current accident rates in eastern strip mining and pre-MESA controls.

VOLUME III

III-1 thru
III-171 Because of the extensive nature of our corrections and modifications in Section III, we have xeroxed this section showing suggested modifications marked in blue.

III-4, Paragraph 1 Atlantic Richfield submitted its Revised Mining and Reclamation Plan (dated 20 May 1974) on June 10. This gives considerable additional data on mitigating action.

III-17, Paragraph 3 Additional information on the location of electrical lines (Enclosure V) is attached which will allow you to rewrite this section. On April 25, 1974 maps and diagrams on the 69 KV line which will extend to our Black Thunder Mine were sent to Mr. Robert Currier of the E.I.S. writing team.

III-27, Paragraph 2
Line 3 Under a wetter climatological regime such depressions would fill with water and breach the lowest point. Erosion at that point would then drain the depression. Comparison of the Roland Coal Isopach Map with the Roland Coal Overburden Isopach Map (RMRP; 20 May 1974 Enclosures I & II) shows that subsidence over burned coal is not involved.

III-27, Paragraph 2
Lines 5, 9, 10 The Rochelle hills are composed of shaley clays with isolated sandstone lens and are capped by coal clinker (resulting from burned Roland Coal) and natural brick("scoria" resulting from baked overburden clays). The escarpment is not a massive resistant sandstone exposure. The cracked and broken cap of natural brick and clinker form the resistant layer that protects the shaley clays from erosion and also provides a soil of greater porosity allowing Ponderosa Pines to grow on the hills.

- III-31 to 38 Considerable additional soils information is available in the July 1974 report from Wyoming Environmental Institute (Enclosure I).
- III 65, Paragraph 1
Lines 4, 6 Figures for the drainage area of North Prong of Little Thunder Creek are high.
- III-65, Paragraph 2
Lines 2, 3 Figures for the drainage area of Little Thunder Creek are wrong.
- III-65, Paragraph 3
Line 3 Closed basin formation not due to burning of underlying coalbeds (See comment III-27, Paragraph 2, Line 3).
- III-66, Paragraph 1
Lines 3-4 Figures for mean annual flow for North Prong Little Thunder Creek are probably high. Compare with same data for Little Thunder Creek.
- III-68 to 75 The term "community" is used in Table 11 and Figure 9. Ecosystem is used from Pages 71 to 75. Community is probably preferred. In any case, adding animal and soil classifications to the vegetative community designation does not make this a discussion of ecosystems.
- III-76 Archaeology. Updated information in Wyoming Environmental Institute report July 1974 (Enclosure I).
- III-79 to 81 A discussion of the color, intrusiveness, absorption, and accents of the visual impact of a surface coal mine should appear here in the report.
- III-91, Paragraph 2 Secondary access roads, National grassland roads. The description of access to Little Thunder County Road from Highway 59 is incorrect. Wright Road and its connection via Road #928 are absent (See Thunder Basin National Grasslands Map--1973).
- III-91, Paragraph 2
Lines 3-8 Suggested insert: Wright County Road.... deadends at County Road T-7. Two miles north on T-7, Little Thunder County Road extends southeast and east approximately 26 miles to Lynch County Road. Wright Road will possibly be extended eastward 4½ miles between the Atlantic Richfield and Kerr-McGee leases as the major access road for both.

- III-103, Paragraphs 1, 2, 3 This three-paragraph discussion of probable impact on soils contains some incorrect information based on the obsolete mining plan. The use of inclusive adjectives and generalized statements detracts from its ability to discuss probable impacts objectively. A discussion of destruction of the existing soil pattern and alteration of soil character appears in the Wyoming Environmental Institute report of July 1974 (Enclosure I).
- III-111, Paragraph 1 Routes for the railroad spur and access road
Lines 6 to 7 have been selected (Enclosure V), allowing identification of vegetative communities affected.
- III-111, Paragraph 2 The plant site has been selected, allowing
Lines 6 to 7 acreages of disturbed vegetative types to be calculated. (Revised Mining and Reclamation Plan, May 20, 1974, Page 26).
- III-138 Obsolete. The proposed reclamation plan on pages 31 to 64 of the Revised Mining and Reclamation Plan, May 20, 1974 addresses mitigation measures. Habitat loss, including replacement of Reno Reservoir are discussed therein.
- VOLUME V
- Appendix A, Map 6 For the Atlantic Richfield Company mine, the number of permanent employees shown on the map should be 225, and the number of construction workers should be 100.
- Appendix C-38 Due to a change in subject matter, a new subtitle Permanent Habitat Losses, should be inserted above the third paragraph.
- Appendix C-39
Line 7 The actions described will not preclude the re-establishment of wildlife, but rather the mix of wildlife will be altered considerably--favoring man-adapted species.
- Appendix C-39
Paragraph 1,
Line 6 Acreage figures given for lost habitats do not agree with Page I-518, Paragraph 2, Line 1. Acreage figured seems high and should be explained.
- C-40, Paragraph 1 First sentence should read: Permanent changes from terrestrial to aquatic categories may also occur.
- C-40, Paragraph 2
Line 10 "Either man-induced or natural processes" should read: Natural processes, often times accelerated by man's reclamation activities....

C-41, Line 14

Although the studies referred to show that vegetative cover is less on farmland abandoned 40 to 45 years ago, than on adjacent undisturbed rangeland subject to the same grazing pressure, it also shows that range conditions are actually better on the abandoned fields than on the adjacent rangelands. See Enclosure I, Page IX-44.

C-42

Enclosure I, referred to in C-41 gives a more positive view of vegetation recovery along pipelines. We believe this should be considered. Unattended pipeline and abandoned fields are not comparable to a situation of well-managed rehabilitation such as that contemplated by the Atlantic Richfield Company.

C-42, Paragraph 1
Line 2

It is not correct to assume that rehabilitated mined lands will receive little or no continued special management. Mining companies will be long-term residents of the area and will have ample opportunity to take additional corrective measures if initial rehabilitation efforts are not successful.

C-43, Line 1

To say that sagebrush grassland "may be unable to recover" is a generalization. Recovery should be defined, in terms of range conditions, ground cover, biomass, etc.

C-43, Paragraph 1
1st indent

While vegetative cover may well be reduced, it must not be assumed, as was done in this Draft Environmental Impact Statement (Page I-59, Item 7) that productivity for grazing purposes will also be reduced. On Page IV-48, Enclosure I, observations by the University of Wyoming research team are "It is very possible that in general, more herbage is being produced within abandoned fields than on the undisturbed native areas".

C-43, Paragraph 1
Indent 2

Atlantic Richfield Company plans on salvaging at least some of the shrub component by transplanting shrub pads. Extensive range management studies should provide information on the reinvasion of sagebrush. For further information, see:

Harniss, Ray O. and Robert B. Murray 1973
30 Years of Vegetal Change Following Burning
of Sagebrush--Grass Range.
J. Range Management 26(5): 322-325.

Kearl, W. Gordon and Maurice Brannan 1967
Economics of Mechanical Control of Sagebrush
in Wyoming.
Sci. Monog. 5, Ag. Experiment Station,
University of Wyoming, Laramie.

C-45, Line 2

The cottonwoods, and the Black Willows (Salix
exuga) that they are associated with, can be
replaced by planting and nurturing shoots
in appropriate locations.

C-45, Paragraph 2
Line 12

"Total numbers of biomass" is a meaningless
phrase. Perhaps the author meant "Total
numbers and biomass."

C-51, Paragraph 3
Line 3

What is meant by "total wildlife"? If the
author is referring to diversity, the statement
is true. If he is referring to biomass, the
statement is debatable.

C-52, Paragraph 2

Due to the nature of the overburden in the
study area, highwall cliffs would soon
deteriorate, and would probably not provide
increased nesting sites for various birds.

C-63
Family: Turdidae

All species listed below Eastern bluebird
belong in family: Fringillidae.

C-64
1st Family

Audubon's warbler no longer exists as a species.
It is included with Yellow-rumped Warbler.

THE CARTER OIL COMPANY

HOUSTON, TEXAS 77001

July 26, 1974

HARRY PISTOLE
PRESIDENT

POST OFFICE BOX 2180

Mr. Dan Baker, State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

The attachments to this letter, listed below, have been prepared for The Carter Oil Company in response to the draft Environmental Impact Statement for the Eastern Powder River Coal Basin.

Some of the material submitted is new information relating to the industrial rail spur which will service the North Rawhide Mine. This information, which is supplementary to that previously submitted, relates primarily to the route of the spur and the location of the loadout loop at the mine. We wish to make clear that the impact of this spur in terms of socioeconomic conditions, rail traffic increase, and related changes in the environment are included in the regional analysis section of the present draft statement; our intent here is simply to describe the current plan for the spur in somewhat greater detail.

The remaining material is a critique of certain assertions made in the draft statement which may cause action detrimental to the operation or to the environment, or both, under circumstances where offsetting benefits are nonexistent or negligible.

The attachments are as follows:

- 1) A memorandum prepared by R. L. Lindauer consisting of an evaluation of groundwater conditions at North Rawhide and adjacent lands and including proposed changes in the impact statement relating to assertions about groundwater in the area.
- 2) A memorandum prepared by Carter's staff containing both additional material on Carter's industrial rail spur, and Carter's response to several assertions made in the impact statement or at the hearings which took place in Wyoming. We call your particular attention to the portion of these remarks dealing with operating incentive to control dust during mining operations and the adverse environmental effects of imposing arbitrary limits on final slopes.

Mr. Dan Baker, State Director
July 26, 1974
Page 2

- 3) A summary specifications sheet for the Middle Fork Dam and Reservoir. We have ascertained that the Sussex Irrigation District has transmitted to the BLM all information relating to this project. The attached specifications sheet is a summary of relevant information. This information was requested by a panel member at the end of my remarks in Cheyenne.
- 4) A brief report by James P. Lodge relating to atmospheric predictions made in the impact statement or during the public hearings. Dr. Lodge has submitted this material directly, but we resubmit it here for completeness.

In addition we draw to your attention the supplemental information which Mr. George L. McGonigle submitted on our behalf on June 26, 1974. All of this information is in addition to testimony given by Carter at the public hearings in Wyoming, and is partially in response to comments made in those hearings.

As I have mentioned at the Eastern Powder River Environmental Impact Hearings in Cheyenne, we are hopeful that we will receive early approval of our mining plan for the North Rawhide Mine from the USGS to enable us to supply coal to out-of-state utility contracts. We plan to expand the utility sales phase of our operations as rapidly as we can obtain new sales contracts consistent with our ability to responsibly expand our operations to supply such contracts. In this connection, we have a sales proposal outstanding to an out-of-state utility customer that will, if accepted, lead to a request for approval of a mining plan on another of our Federal lease blocks in the Gillette area.

I want to personally reiterate that Carter is entirely dedicated to compliance with the law in the matter of environmental activities, and we are determined to minimize or eliminate degradation of the environment in our operations. You may be sure that we will take all steps necessary to meet the goal of maintaining a quality environment.

Very truly yours,


Harry Pistole

HP:dd
Attachments

THE CARTER OIL COMPANY

HOUSTON, TEXAS 77001

August 1, 1974

HARRY PISTOLE
PRESIDENT

POST OFFICE BOX 2180

Draft Environmental Impact Statement
Eastern Powder River BasinSubmission Concerning Adequacy of
Local Government Revenues in
Campbell County, WyomingMr. Dan Baker, State Director
Bureau of Land Management
U.S. Department of the Interior
Box 1828
Cheyenne, WY 82001

Dear Mr. Baker

The following comments are an addition to those submitted with my letter dated July 26, 1974.

Several participants in the recent Eastern Powder River Environmental Impact Hearings expressed concern over the consequences of large-scale coal development and attendant population influx on the financial ability of local governments to provide needed public facilities and services. Since the Draft Environmental Impact Statement does not directly examine this question, and since the greatest impact will fall on Campbell County and the City of Gillette, we have made an analysis of anticipated governmental revenues and revenue requirements for this area. Long-term revenues will be more than adequate in total, although maldistribution may cause problems for the City of Gillette. The Wyoming Joint Powers Act enacted by the 1974 session of the legislature provides for cooperative action by governmental agencies to alleviate problems of maldistribution of revenues. A copy of this act is attached.

The many uncertainties concerning the extent and timing of coal mine development and the installation of coal gasification facilities preclude definitive forecasting. Nevertheless, an approach which uses consistent bases for estimating populations, employment, and the property tax base should give reliable indications of the relative rates of increase in governmental revenues and in the expenditures that will have to be made to meet the needs of an expanding population. In our work, the Environmental Impact Statement has been taken as the basic document defining population growth, coal mine production, and the installation of coal gasification facilities. Revenue requirements from a Capital Facilities Study - Powder River Basin - prepared for the Wyoming Department of Economic Planning and Development have been adjusted to the population projection of the Environmental Impact Statement so that revenues and revenue requirements are on a consistent basis. Combined county, city,

and school expenditures in Campbell County are projected to average about \$600 per capita and appear quite favorable relative to those in other areas of rapid growth in population. We have also drawn on the Capital Facilities Study as a source of information on noncoal related revenues so that the analysis could be completed to show the overall excess or deficiency in revenue of the various governmental bodies. In this connection, we have used more realistic estimates of the current prices of coal and crude oil.

The attached table summarizes the results of this study assuming a continuation of the 1973 tax rates. All data in the table are expressed in 1973 dollars. Inflationary additions to revenue requirements should be compensated for by inflation induced additions to tax revenues.

The conclusions to be drawn from this study which covers the period through 1990 are:

1. Large increases in the taxable base in rural areas will result in substantial excess revenue to the County and to the School District throughout the period.
2. The City of Gillette will have a chronic revenue shortage; however, with cooperative action under the Wyoming Joint Powers Act, the combination of City and County revenues should be sufficient to meet all needs with judicious use of revenue bonds to resolve near-term funding problems.
3. Substantial reductions in tax rates and in charges for power, water, and sewer services should be possible by 1980.

We believe that the large tax revenues from coal mining and gasification will be beneficial to the citizens of Campbell County and Gillette.

Very truly yours



km

Attachments

PROJECTION OF REVENUE AND REVENUE REQUIREMENTS
GOVERNMENTAL AGENCIES IN CAMPBELL COUNTY, WYOMING

	<u>Revenue With 1973 Tax Levies</u>	<u>Revenue Requirement</u>	<u>Excess or (Deficit)</u>
	<u>M\$</u>	<u>M\$</u>	<u>M\$</u>
<u>1973</u>			
County	2.6		
Gillette	1.7		
School District	<u>5.9</u>		
Total	10.2		
<u>1975</u>			
County	3.5	2.4	1.1
Gillette	2.0	4.4	(2.4)
School District	<u>8.6</u>	<u>7.3</u>	<u>1.3</u>
Total	14.1	14.1	0.0
<u>1980</u>			
County	7.1	3.5	3.6
Gillette	3.9	6.3	(2.4)
School District	<u>19.6</u>	<u>11.1</u>	<u>8.5</u>
Total	30.6	20.9	9.7
<u>1985</u>			
County	9.8	4.3	5.5
Gillette	5.5	8.2	(2.7)
School District	<u>27.5</u>	<u>14.0</u>	<u>13.5</u>
Total	42.8	26.5	16.3
<u>1990</u>			
County	10.8	4.8	6.0
Gillette	6.1	9.1	(3.0)
School District	<u>30.5</u>	<u>15.9</u>	<u>14.6</u>
Total	47.4	29.8	17.6

MEMORANDUM

PROPOSED ENVIRONMENTAL IMPACT STATEMENT
EASTERN POWDER RIVER BASIN

PREPARED BY

R. L. LINDAUER, JR.

FOR

THE CARTER OIL COMPANY

JULY 21, 1974

PROPOSED ENVIRONMENTAL IMPACT STATEMENT
EASTERN POWDER RIVER BASIN

BY R. L. LINDAUER, JR.

The following comments in reply to the Environmental Impact Statement of the Powder River Basin are submitted on behalf of The Carter Oil Company.

I am R. L. Lindauer, Jr. I reside in Denver, Colorado. I am registered as a professional engineer in Wyoming and have over 20 years of experience in fluid flow mechanics dealing with both surface and subsurface reservoirs and aquifers.

My proposed changes to the draft impact statement deal with the effects that mining and industry will have on local groundwater systems. Specifically, the proposed changes apply to page 103 of Part IV, Volume IV, and pages 493 and 494 of Volume II.

Page 103, Part IV, Volume IV

The first full paragraph on page 103, Part IV, Volume IV, describes the effect mine dewatering will have on the aquifers surrounding Carter's North Rawhide mine. The paragraph is inaccurate in that no recognition was given to the actual topography of areas available for recharge, aquifer discontinuity, and area water well data. Particularly inaccurate is the following statement:

"The cone of depression from the point or points will extend outward to an estimated four to eight miles."

Mine dewatering practices obviously will have some outward effect where aquifer continuity exists. However, both coal and overburden at North Rawhide are restricted, and this severely limits any postulated distance effects. The important points in this regard are:

- 1) Coal is absent east of the clinker hills in the western half of Sections 12 and 13 (T51N, R72W) due to erosion by the Little Powder River and coal burning in the past. The coal is not a continuous aquifer to the east and could not affect wells four to eight miles in that direction.
- 2) Coal is also absent along the northern boundary of Section 11 and in the east half of Section 10 (T51N, R72W) where the edge of the coal deposit trends north in Section 3. Along this northern boundary, coal aquifer continuity is also interrupted.

- 3) Coal is absent in cores obtained near the south boundary of Section 14 and it is probably absent along much of the south boundary of Section 15 (T51N, R72W) because the clinker hills extend into that area. Here, coal aquifer continuity is interrupted on the south.
- 4) Aquifer tests conducted by Charles Fisk, consulting engineer, which were submitted to the USGS as Volume IV of Carter's mining plan show that overburden probably does not charge water into the coal and that the Roland and Smith coal seams are separate aquifers. The first point is shown by the fact that no drawdown was reported in the overburden observation well on October 26, 1973 (page 32 of the report) while the Roland seam water well was being tested (page 25) to a drawdown of 78.9 feet. The overburden observation well was only 22.9 feet away from the Roland seam test well. By contrast the Roland seam observation well 51.6 feet away from the test well had its water level lowered by 14.1 feet, showing continuity within the Roland coal, but not between the coal and overburden. These tests were made in the SW quarter of Section 11 (T51N, R72W). The second point, asserting that the two coal seams are separate aquifers is demonstrated by water quality tests included on page 33 of Fisk's report. Roland seam water has nearly twice the total solids, four times as much carbonates and 17 times as much sulphate as the Smith seam water. This sharp contrast in analyses is in itself adequate to confirm separate sources. In this case there is more evidence. Prior to the production tests by Fisk, the static water level in the Smith seam (198.2 ft.) was shown to be lower than that in the Roland seam (112.7 ft.). This indicates a different hydraulic head for the two coal seams. These facts show the Roland and Smith seams to be separate aquifers.
- 5) Since the Roland seam is higher than the river plain on the east, and is absent to the north and south, it is quite likely that it receives water recharge from local clinker hills surrounding the zero coal line. This makes the Roland seam a very local aquifer with very limited recharge capability. Sufficient continuity to affect water wells from four to eight miles is not indicated by this evidence.
- 6) The Smith coal seam could receive some recharge from the Little Powder River because this seam has a tongue which extends eastward in Section 13 (T51N, R72W) to within about one-half mile of the river. The base of the coal ranges from 40 to 60 feet below the river at this point and could reach into coarse river sediments at this location. The tongue is about one-half mile in width and averages about 50 feet in thickness. Based upon the

transmissibility of 310 gallons per day per foot of head for 80 feet of Smith coal calculated by Mr. Charles Fisk (Volume IV of Carter's mine plan submitted to the USGS), this section of the coal could serve to recharge the Smith coal at a rate of about 11 gpm.

$$Q \text{ gpm} = \frac{T I W}{24 \times 60}$$

Transmission T = 310 gpd/foot of head for 80' of coal in report 50' of coal would be 194 gpd/foot of head

Head I = 50' elevation difference between river bed and coal base. Estimating the river bed to have transmissibility higher than the coal; I for coal tongue could be 40 feet over about 1/4 mile, or 160 feet per mile.

Width W = width of face exposed to river bed in feet

$$A \text{ gpm} = \frac{194 \times 160 \times 0.5}{24 \times 60} = 10.8 \text{ gpm}$$

However, continuity with the coarser river sediments is speculative and further assumes favorable recharge contact conditions at the interface of the coal seams and sediments. Even so the volume of water is insufficient to produce effects four to eight miles away from the mine.

- 7) A more general reason exists for expecting the Roland and Smith seam aquifers at this site to be very limited. In Section 1 (T51N, R72W) the Little Powder River is below the base of the Smith coal along the edge of the coal deposit that is located in Sections 11, 12, 13 and 14 (T51N, R72W). The point where the Little Powder River is below the possible coal recharge level is less than three-quarters of a mile from the northeast corner of the coal deposit. If good continuity with river plain sediment existed in this direction, it would serve as a substantial dewatering mechanism since the head would be about 65 feet over three-quarters of a mile, or 87 feet per mile. As the river flows north, its elevation continues to drop at about 45 feet per mile, which would further serve as a dewatering force if continuity existed in that direction, even through a tortuous path. Rawhide Creek which runs east at about the boundary between T51N and T52N confirms

the limitation on the aquifer. Between this creek and Sections 10, 11, 3 and 4 (T51N, R72W), the dewatering head ranges from 4 to 120 feet per mile because the creek bed has eroded through the coal over most of this area. Even with these hydraulic gradients acting on the north and east sides, the area is void of springs and Rawhide Creek is only an intermittent stream.

For all of these reasons, page 103 of Part IV, Volume IV of the Environmental Impact Draft does not apply to the Carter North Rawhide Block. This text should be rewritten to show that a combination of aquifer separation tests, topography, edge of coal, limited areas for water recharge, and surface data highly restrict any effect on the coal aquifers. These factors taken together show that the coal aquifer is limited and that dewatering operations would be expected to have a limited effect on surrounding water wells.

Volume II--Pages 493 and 494

In Volume II, page 494, a chart is published that should be eliminated from the report. The chart shows drawdown effects at various distances for constant water production at 1,000 gallons per minute. The chart must be the basis for the statement on page 103 of Part IV, Volume IV that water wells would be affected four to eight miles from the mine, though the chart has no application to mine dewatering operations and, in fact, doesn't make sense as a basis for calculating water supply for industry. A description of its basis is on page 493. The chart should be eliminated and the text on page 493 rewritten for the following reasons:

- 1) On page 493 it is stated that these graphs were based on sandstones 100 and 1,000 feet thick, and suggests that the graphs are applicable to Foxhills, Lance, Fort Union and Madison aquifers. Failure to name coal in this paragraph of the report indicates the graphs have no basis for application to coal in a dewatering operation. Moreover, a 100 foot sandstone, with transmissibility through pores will not behave like coal which has fracture system transmissibility. In addition, there are no coal seams 1,000 feet thick. Changing storage coefficients and formation thickness of a normal sandstone will not describe the fluid flow in coal. In spite of this, the graph obviously influenced the report for the Carter site as it relates to the four to eight mile effect. The mere presence of this graph in the draft presents an extremely over-exaggerated impression to those not trained in fluid flow.
- 2) The 1,000 gpm constant rate water production in these graphs cannot be related to coal. A total transmissibility of 425 gpd per foot of head was determined by Charles Fish for the North Rawhide block. A hydraulic gradient of 30 feet per mile, which is as high as recharge elevations would permit on the average, would provide only nine gpm per mile of water flow

with the entire vertical coal surface exposed. This would indicate that 111 miles of exposed coal surface would be required at one time to get this volume of water initially. This is totally unrealistic for the operations planned.

- 3) Even if operations began with 1,000 gpm, by having over a hundred miles of coal face exposed, the assumption of constant flow rate is wholly unrealistic. This assumes an infinite aquifer in all directions, or an unlimited water supply on the up dip side. All of the coal now being considered for mining is perched relatively high in elevation. There is no source for constant production of water.
- 4) Furthermore, the graphs are not applicable to coal even by implication because they do not account for boundary conditions and extensive discontinuities shown to exist in the aquifer on the North Rawhide block. This condition is thought to exist throughout the coal area because of burnt coal and surface erosion.
- 5) The graph on page 494 is not really applicable even to water in sandstones, the purpose for which it was calculated as described on page 493. It assumes industry would try to supply its water needs from a reservoir that is only suitable for stock water wells. There is no way a well or group of wells depicted by this graph could provide a continuous supply of water at 1,000 gpm. The chart itself demonstrates exhaustion of the water supply within a relatively short time. This can be easily shown to the average person by simply interpreting the chart. By extrapolating the one year straight line on the lower chart to determine the drawdown 100 feet away from the production source, extrapolate three log cycles to reach a drawdown of 10,000 feet. This is equivalent to a 4,300 psi drawdown in pressure at a location where not more than 7,000 psi is available in the deepest water zones. and less than 70 psi is available in zones above 1,000 feet.

The entire analysis is erroneous on its face by not recognizing the physical facts of the area.

Because of the aforementioned, it is recommended the paragraph on page 493 referring to this chart be rewritten and the chart on page 494 be removed from the statement. The rewritten paragraph should cover the following points.

- a) The coal is interrupted at or near the surface in many areas along its trend. These interruptions limit the extent to which surrounding wells can be affected because there is no aquifer continuity.
- b) Coal has low transmissibility and low storage capacity. It is not a good aquifer. This and the continuity interruptions should tend to make the effects of dewatering operations a local and limited situation except in unusual recharge areas.
- c) Dewatering volumes should decline with time because of low transmissibility in coal, limited initial pressure in coal, limited elevation differences in recharge areas, and limited recharge areas. Even if an infinite aquifer of good quality existed, the water volume would naturally decline with time because of the constant head caused by the mine face.
- d) Industry should not be expected to use water sources at the surface generally used for watering livestock because water supplies would be inadequate. State laws protect the shallow well owner from use of these zones for industrial purposes.
- e) Water levels around each mine should be monitored so corrective action can be taken when unusual watertable effects do occur because of local hydrological conditions.

THE CARTER OIL COMPANY

Memorandum

Review Comments

on

Eastern Powder River Coal Basin
Draft Environmental Impact Statement

July 30, 1974

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31 1.0 Industrial Spur Track and Loop

Introduction

The following information relating to construction of a railroad industrial spur track connecting Carter's Rawhide Mine with the main track of the Burlington Northern Railroad is submitted as a supplement to data reported in the draft of the Eastern Powder River Coal Basin EIS. At the time of preparation of the impact statement Carter's planning was not sufficiently definitive to specify the alignment of the industrial spur. Although engineering is still preliminary, Carter and the Burlington Northern Railroad have selected a general alignment for the spur which connects with the main track several miles east of Gillette. This route was selected for the following reasons.

- 1) feasible alternative routes approaching the Rawhide deposit from directly south cross shallow coal, which would be unavailable for the life of the spur, and might be permanently lost.
- 2) an alternative route paralleling Route 59 from just west of Gillette would increase rail traffic through Gillette by eight to ten trains weekly, or in excess of one train daily. This route also requires large cuts to be made just south of North Rawhide in order to reduce the average grade to the one percent maximum that can be traversed by loaded unit trains.
- 3) grade crossings and interference with the existing highway and road network is minimized by utilizing the planned route.
- 4) sidings into a number of proposed operations can be constructed, if and when needed, with minimum additional effort.

Specifications and Construction

Carter's spur will consist of approximately twelve miles of single track industrial spur and about 9000 feet of loop

track. Track will consist of 131 pound rail set at standard guage. Construction and maintenance of the industrial spur will be the responsibility of the Burlington Northern Railroad. Carter anticipates constructing the loop track (with BN approval of design and engineering) but maintenance after construction will be assigned to the BN. The general route of the industrial spur track is shown on the attached Figure 1.

Conditions along the right-of-way are anticipated to be similar to conditions along the BN/CNW Railroad branch line to be constructed between Douglas and Gillette. Under these circumstances right-of-way width will vary from 150 to 600 feet. The total amount of land required for the industrial spur track is estimated to be approximately 240 acres, or twenty acres per mile. None of the land is government owned or held. The alignment, as shown would include five improved road crossings and four unimproved road crossings, but by modest adjustment of the alignment up to one-half of these crossings may be eliminated. There will be grade separation where Highway 59 and the loop track cross.

Construction specifications are projected to be nearly identical to those for the BN/CNW branch line, all adequately reported in Volume II of the impact statement.

Operations

The industrial spur track and loop track at the Rawhide Mine are to be used primarily for unit coal trains. Most trains will be made up of about 110 cars, each with approximately 100 tons carrying capacity. Trains are to arrive at more or less uniform intervals, but by 1977 Carter is planning on laying a second loop track inside the first so that two trains could be accommodated simultaneously. The production statistics and their impact on socioeconomic conditions and railroad operations have been included in the draft impact statement, and are not repeated here to avoid retabulation. General operating conditions are forecasted to be much like those for the BN/CNW branch line, which are reported in the draft impact statement.

Topography and Revegetation

The proposed route follows the topographic grain of the terrain. This terrain is principally rolling prairie and a few

low hills. At the extreme north end of the spur track, it crosses through a low divide and ties to the loop track. The loop is located in the Little Powder River valley, as shown on Figure 2. Unimpeded drainage of the Little Powder River will be provided for by culverts and straightening of meanders in the immediate area of the track. Fill for the loop track will be borrowed from over the coal or from where construction excavation will be required. This will minimize creation of borrow pits and aid in reducing the size of initial spoil volumes. Right-of-way and embankments for both the loop and spur track will be revegetated as described for the BN/CNW branch line in Volume II of the draft impact statement.

Traffic

Carter's initial coal contract is for five million tons annually once full production is reached in 1978. Assuming 110 cars per train, each with 100 tons capacity, the number of trains required is eight or nine weekly, or slightly more than one train daily. For twelve million tons annually, nineteen to twenty-one trains weekly are required, and any increases in production beyond this rate will increase traffic volumes accordingly. We point out, that this is precisely our reason for eliminating the route which joins the main line west of Gillette. The chosen route, which joins the main line well east of Gillette circumvents the problems associated with increasing rail traffic through town.

2.0 Final Slopes

The next few paragraphs relate to remarks suggesting as a mitigating measure that all final slopes be reduced to grades not in excess of three to one. As it relates to Carter, this proposal would affect the final highwall, and certain perimeter areas along the north and south boundaries of the mine. Most of these areas will be mined at a distant point in time, and Carter would hope that considerable flexibility relating to final slopes will be built into regulatory policy, so that the results of subsequent research and experiment can be applied at the time the work must be done. By this statement Carter does not wish to indicate that we are opposed to good reclamation, quite the opposite, we wish to be able to apply the best technology in existence at the time any given area is ready for reclamation.

Carter proposes to grade most banks to slopes close to the angle of repose or to an angle which will support reclamation, but not necessarily to slopes as flat as three to one. Carter's proposal is consistent with good conservation and reclamation because the geometry of mining is such that flat terminal slopes cause either a loss of coal in the case of cut slopes or disturbance of more surface than is necessary under flat-sided spoil piles. In the case of final cut slopes coal losses per mile of pit perimeter amount to 1.9 million extra tons by reducing the slope from two to one to three to one, or alternatively, disturbing an extra 24 acres of land per mile of perimeter. These calculations are based on an average 150 feet of overburden and 50 feet of coal at the perimeter.

The situation thus outlined, brings Carter to the conclusion that the question of slope angles ought to be re-examined. In defense of steep slopes we draw to your attention that Carter's mine area already contains appreciable areas with slopes steeper than three to one. In addition one has only to drive from Cheyenne to Douglas to see several instances where the Wyoming Highway Department has successfully revegetated much steeper slopes. Carter's recommendation, therefore, is that slope constraints not be set arbitrarily, rather the permissible slope angle should be established by experimentation with grades that leave stable banks, in harmony with surrounding terrain, and capable of sustaining plant life.

3.0 Productivity of Reclaimed Land

This section has been prepared in response to what Carter believes is an unduly pessimistic stand relating to the potential for revegetation of mined lands. The draft impact statement for the North Rawhide Mine forecasts a reduction of 50 percent in soil productivity as a result of mining (p. IV 151). The basis for this statement, and for a pessimistic tone relating to revegetation in general, appears to be the National Academy of Sciences report "Rehabilitation Potential of Western Coal Lands." This document, although critical of success in places, can also be construed as supporting the contention that reclamation, and revegetation of an entirely satisfactory nature is possible under climatic conditions as they exist at North Rawhide.

ation:¹ The following excerpts are quoted for your consideration:

- 1) "Because natural ecosystems correlate well with climates and soils, plant communities can serve to identify the regional potential for natural or induced revegetation. The coal regions of the west support four major vegetation types: desert shrub, foothill shrub, Ponderosa pine and associated mountain brush, and prairie mixed grasses. Desert shrub areas are not easily revegetated and natural plant succession is extremely slow. In the foothill shrub areas, even the best methods may fail during drought years. The mixed grass prairies and the areas of pine and mountain brush on the other hand, have a high potential for successful revegetation."²

¹Environmental Studies Board. Study Committee on the Potential for Rehabilitating Lands Surface Mined for Coal in the Western United States, Rehabilitation Potential of Western Coal Lands. Cambridge, Mass.: Ballinger Publishing Company, 1974, 198 pp.

²Ibid, p. 2.

- 2) "We believe that those areas receiving ten inches or more of annual rainfall can usually be rehabilitated, provided that evapotranspiration is not excessive, landscapes are properly shaped, and techniques demonstrated to be successful in rehabilitating disturbed rangeland are applied. However, we must emphasize that this belief is not based on long-term, extensive, controlled experiments in shaping and revegetating western lands that have been surface mined. Few such studies have been made, and those in progress have only a few years data to report. Nevertheless, much research has been done on revegetating western ranges, disturbed roadways, and other denuded areas in arid lands. We believe that the techniques developed in these studies can and should be adapted to the higher rainfall areas of the west. ..."³
- 3) "The mixed grass area of the northern Great Plains also offers a rather high probability for satisfactory rehabilitation. Rainfall is generally adequate for establishing vegetation by seeding. This has been demonstrated in rangeland seeding projects throughout this region. Predicting such results assumes that the best technology will be applied, including the addition of topsoil and selective sorting of spoils to avoid placement of clays and toxic substances on or near the surface."

Clearly the information developed from past studies in revegetating western ranges and disturbed roadways is useful. For example, Exxon's Highland Uranium Mine near Douglas, Wyoming, has profited from reclamation methods suggested by Wyoming's own State Highway Department and the Upper Cheyenne Conservation District.

In addition, we point out that the Wyoming 1973 Environmental Quality Act under Article 4, Section 35-502.24 (b) (ix) calls for a plan to accompany permit applications which assures the state that acid forming, or toxic materials uncovered during or created by mining are treated or disposed of in a manner to prevent water pollution or health and safety threats.

³Ibid, p. 3.

The Carter Oil Company will bury toxic materials deep in the spoil dump. These materials will be covered by overburden favorable to plant growth. Preliminary tests on drill cores made by University of Wyoming personnel indicate that at North Rawhide the materials most likely to inhibit plant growth are a clay parting and certain sandstones. Carter's mining plan is designed to segregate these materials and bury them; we believe our previous explanations of this procedure, in conjunction with the reclamation bonds already filed, to be adequate assurance of our concern and intentions in this matter.

4.0 Archaeological Approvals

Carter has undertaken in its prior work, as reported to the U.S. Geological Survey, the Environmental Impact Study Team, and the Land Quality Division of Wyoming's Department of Environmental Quality, to determine and report any directly observable archaeological sites, and to assess probable sites. Carter is continuing to seek expert guidance in this area, in spite of reports that suggest that archaeological materials on or near Carter's mine sites are insignificant or nonexistent.

Carter fully intends to comply with federal and state regulations relating to archaeological and palaeontological sites, but we are concerned that the proposals requiring coordination and certification of archaeological surveys by the State Archaeologists may set precedent for (a) Federal stipulation of state procedures for enforcing both federal and state laws and requirements, and (b) stipulation of regulatory procedures outside the boundaries of provisions existing in statutes, codes, and regulations. Certification of the type recommended ought to be given very careful consideration as to cost versus benefits, and it should be weighed carefully relative to the other elements that might also be certified, to determine if establishing a precedent for multiple certification by the several special agencies is really advisable. If some such certification is deemed necessary, and Carter questions the wisdom of splintering responsibility for monitoring environmental conditions among several agencies, then Carter recommends that the procedure for such certification be incorporated in the general procedures for securing a mine plan to insure that the proposal obtains an adequate hearing and is given due consideration by the responsible agencies, both federal and state.

5.0 Dust Control

This section relates to concern expressed at the public hearings over creation of dust in mining operations with the inference that operators tend to ignore dusty conditions. This inference is simply not supported by observation. Dust abatement programs have been, and will continue to be aggressively pursued; first, because they are required by law, and finally, because they save money.

Dust in concentrations sufficient to be a nuisance to the general public would reduce the visibility of heavy equipment operators to the extent it would result in a severe hazard to the entire mining operation. Such a hazard jeopardizes both employees and equipment safety and simply cannot be tolerated in a modern mining operation.

Dust is also harmful to equipment. Carter's trucks alone, cost in excess of 350 thousand dollars each, and dust at the nuisance level would shorten the lives of engines and moving parts to an intolerable extent. Dust abatement is the sole solution to this problem.

The major sources of potential dust in an open pit operation are haul roads, crushing, and plant operations. Carter's plans for roadways call for sprinkling with an asphalt-water emulsion and prompt, well kept revegetation of bar ditches, shoulders, and roadcuts. Unreclaimed surfaces will be minimized, dusty areas will be covered with mulch, and temporary soil and overburden piles will be reseeded when necessary to eliminate dust. Plant dust abatement will be a combination of careful design for good housekeeping, in conjunction with an up-to-date dust suppression and collection system. These plans, in conjunction with the high moisture content of North Rawhide coal, will, when coupled with a safety conscious supervisory group and workforce, assure us of minimal dust.

**KERR-McGEE COAL CORPORATION**

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

July 31, 1974

State Director, Bureau of Land Management
Wyoming State Office
2120 Capitol Avenue
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

In accordance with our brief statement at the Department of Interior's public hearing in Gillette, Wyoming, June 27-28, 1974, the Kerr-McGee Coal Corporation hereby presents its full comments on the "Draft Environmental Impact Statement - Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming."

We commend the general approach taken in preparation of the Draft Environmental Impact Statement to facilitate detailed consideration of our pending proposal for a mining plan and to lay the necessary groundwork for prompt consideration of future proposals, particularly those for coal mining on leased land which can be developed rapidly in accordance with consumer needs. We also believe the draft deals adequately with a wide variety of important questions regarding possible environmental impacts from coal development in the area. The comments which follow are submitted for the purpose of strengthening the statement and to respond to several oral comments made during the public hearings, as we understand them.

In general, we believe that the draft can be improved by eliminating statements that are unrealistically pessimistic. Also, if the environmental impacts of coal development in the basin are to be properly considered, full recognition must be given to practicable mitigating measures. In this regard, we would point out that federal and state laws require reclamation with respect to soils and vegetation and that effective measures can be taken to offset adverse socio-economic impacts. Our attached detailed comments speak to these points.

State Director
Bureau of Land Management
July 31, 1974
Page two

Also, we would point out that the positive environmental impacts on large, energy-consumer areas of the United States which will result from the mining of Eastern Powder River low-sulfur coal are given no attention. These beneficial impacts include the meeting of air quality standards in the generation of electricity and the socio-economic benefits of provision of electricity at a relatively low cost. The effects on these consumer areas should be given important recognition both in connection with the mining applications covered in this report and the proposals which may arise for mining existing leases, because these operations, along with supporting transportation and electric power facilities, are necessary to meet the immediate environmental needs of large numbers of American citizens.

Environmental impacts of projected production, from existing leases in the Eastern Powder River Basin on the local area itself, are not only manageable within required environmental quality standards but beneficial to the economy of the area. We intend to abide by these standards so that the population of both the basin and of our customers' consumer areas will benefit.

Thank you for the opportunity to comment on this important report.

Very truly yours,

KERR-McGEE COAL CORPORATION



F. A. McPherson
President

FAM/jw

cc: Phil Bennett w/attach.
T. Cochran "
J. J. Kelly "
R. R. Smith "

DETAILED COMMENTSVolume I, Part I -- Chapters I through IV

Page I-22

Although underground mining may be possible in some areas of the Eastern Powder River Basin, the first sentence of the first full paragraph and the subsequent discussion incorrectly imply that the entire coal reserve is amenable to extraction by either open cast or underground mining and that the judgment as to which mining method to use is based entirely on economics. Actually, present technology severely limits the reserves which can be recovered at any cost by underground techniques.

Pages I-278
to I-290

From the general discussion of archeological and paleontological values, it would appear that considerable evidence has already been gathered relevant to a fairly homogeneous Powder River Basin area and that, as with past development of populated areas, coal development will assist -- rather than deter -- the recovery of further evidence. The sentence on page I-285, which states, "The Kerr-McGee and Carter reports were not intensive archaeological surveys and more sites which were not seen or recognized probably exist in these areas." is an unsubstantiated and subjective conclusion which implies inadequate investigation by the Kerr-McGee archaeologist

and doubtful credibility as compared to investigations by others. This sentence should be eliminated. The first sentence of the same paragraph describes the Kerr-McGee survey and speaks for itself.

Pages I-292
to I-312

There are numerous references to historical sites outside of the Campbell County, Converse County areas that have no bearing on this environmental impact statement and should therefore not be included in it. For example, figure 47 and text refer to preserved Oregon trail ruts that are outside of the Powder River Basin coal development region and not endangered by development in the Powder River Basin.

Page I-469

New land forms may emerge from coal removal in relatively limited areas at the time in which these operations are being carried out. However, the general nature of the existing natural land forms in the Eastern Powder River Basin is similar in many respects to those created by surface coal mining even if no reclamation action is taken. Furthermore, reclamation laws will require proper reclamation techniques to be employed so that there will not be improper placement or insufficient reclamation of spoil materials. In view of these facts, the implications on this page that surface mining will significantly impact on the topography of the area is not warranted.

A single mining operation producing 17.5 million tons of coal per year in a 60-foot coal seam will disturb approximately 180 acres per year in uncovering the coal; however, if the mining operation uses a shovel-truck or similar method of overburden removal, grading can be done concurrently with mining and seeding will take place as soon as the growing season permits. Therefore, no more than 360 acres will be unreclaimed and unvegetated at any one time.

Page I-475

It is acknowledged that there will be significant impact on soils from mining; however, with topsoil

32 removal and stockpiling all soil characteristics, microorganisms and climatic relationships will not be destroyed on 14,000 acres by 1990. The Wyoming Land Quality Act Requires topsoil removal if it exists.

Page I-477

Paragraph 2 refers to disturbances that will reduce soil productivity, permeability and infiltration rates, thereby causing an increase in runoff, soil erosion, sedimentation, etc. The detrimental effects as noted are not unique to coal development. For example, overgrazing of possibly 90 percent of the entire surface of the Powder River Basin area is resulting in soil erosion and sedimentation damage. The report should take account of the environmental impacts of these alternatives to surface mining of coal.

Regulatory requirements compel mining operations to reclaim the land surface to equal or better productivity than existed prior to the land disturbance caused by mining so the implication that land surface productivity will be permanently reduced by 0.6 percent is unfounded. Furthermore, there can be a substantial gain to soil productivity if the value of coal revenues to the community is applied to improved soil conservation practices throughout the basin area.

Page I-481

One (1) 197-foot silo does not contain 50,000 cubic yards of concrete, but rather approximately 2,000 cubic yards. Thus, Table No. 7 is in error and the cumulative sand and gravel requirements by the year 1990 would be 97,000 cubic yards, based on the EIS estimate of the number of silos as 97.

Page I-483

3.6 million cubic yards of aggregate required for roads, railroads and silo construction is in error (also see page I-539 and I-867).

Page I-499

Water infiltration rates in reclaimed overburden are expected to be higher than through natural ground due to erosion-prevention techniques on the surface and uncompacted fill material.

Page I-612

The omission of socio-economic mitigating measures from both the regional analysis (except for a brief discussion of land use planning) and from the site analyses is glaring, particularly after the extensive discussion of mitigating influences to impacts in the physical resource sectors, such as wildlife, water, vegetation, etc.

Strangely, no mention is made in the draft of any reason for omitting mitigating measures for socio-economic impacts. This is true even of Appendix C which attempts to describe approach and methodology on page C-91 through C-93. Since the statement's treatment of socio-economics proceeds directly from a discussion of impacts to a discussion of unavoidable adverse effects, without considering mitigating measures, some readers may be induced to give insufficient consideration to the fact that action can be taken by government, the public and industry to increase the existing supply of facilities and services beyond that inventoried in Chapter IV of Part I. Readers could also be led to ignore that measures can be taken to improve the public sector's responsiveness to projected impacts.

At least two significant mitigating influences which would be helpful to discuss at some place in the EIS are the following:

(1) Decision makers are receiving advanced warning of the potential socio-economic impacts.

Collection and consolidation of quantitative information on the plans of a large number of separate companies for a specific region is a relatively innovative planning accomplishment. The public sector could reasonably be expected to respond with needed services in this case in a more timely fashion than it has in the past. The EIS itself is thus a strong mitigating influence, as are also other warning efforts to some extent, such as DEPAD's* recent combined coal and uranium impact analysis, or the series of meetings which have been held with local public leaders by subcommittees of the industry's Powder River Basin Study Group. This industry group was set up at the request of Governor Hathaway to assist his newly appointed Advisory Council which is holding public discussions on ways to prepare for industrial development.

It has often been pointed out that some of the adverse socio-economic impacts recently experienced from industrial development near Rock Springs might have been avoided had local decision makers received more timely information on company plans and their resulting effects on population and demand for housing, transportation, utilities and services.

*The Department of Economic Planning and Development,
(Wyoming)

Responsible government officials have already begun to respond to anticipated impacts by increased planning efforts. By not mentioning some of the possible mitigating measures already being debated at state and local levels of government, the draft is ignoring the willingness of Wyoming government to accept its responsibilities. The EIS team is in contact with numerous officials who would provide information on the extent of current planning efforts and on ideas and proposals which would be worth discussing in the statement as mitigating measures.

The coal industry itself has already begun to provide at least some measure of assistance to the existing housing market system. Announcements of housing projects and studies sponsored by various coal companies have appeared on several occasions in the Gillette and Casper newspapers. The Douglas and New Town Subcommittee of the Powder River Basin Study Group is currently supporting a \$100,000 feasibility study to investigate housing alternatives in support of the growth expected to occur in the neighborhood of Panhandle Eastern's proposed gasification plant.

(2) Wyoming will receive large amounts of tax and royalty income as a result of coal development. The draft's occasional mention or implication that increased tax revenues will somehow occur with the coal development is hardly adequate treatment of this

crucial factor which has such an enormous effect on the public sector's ability to prepare for and respond to socio-economic impacts.

The EIS should describe the various sources of tax income which will be generated both from the coal industry itself and from the service sector which is generated through the multiplier effect. Quantities and timing of major revenue sources should be estimated, and if possible should be related to estimates of the amounts and timing of funds needed to provide facilities and services. Comparison could at least be made between projected tax revenues and current budget levels to demonstrate the proportional impact of coal-generated revenues. Allocation problems should also be addressed. A discussion of problems of revenue allocation and timing would be helpful both to those persons responsible for developing solutions and also to those persons attempting to pass judgment on the proposed actions.

Also, some additional, constructive discussion should be included on the ability of the public sector to respond to socio-economic needs. By limiting its analysis only to a contrast of the existing supply base of facilities and services with projected future demand, the draft tacitly dismisses the public sector's ability and intent to prepare for and respond to impacts

Even worse, the response system itself is not examined, and no means are considered for improving it.

Page I-624

Optimum vegetation stability requires slopes of less than 25 percent (4 to 1), not (5 to 1) as indicated.

Page I-639

We question the basis for the words "Furthermore, it will be required ..." in the next to last paragraph. If there is no present law which specifically requires the indicated action, the paragraph should be deleted.

Delete the first line and the first three words of the second line of the last paragraph and combine the remainder with the second sentence so that it will read: "A full-time resident basin paleo-archeologist under the supervision of the State Historic Preservation Officer would aid in reducing lead time and development delays by performing advance surveys ...

Page I-651

In some cases, no topsoil exists and surface material is sterile, while lower strata are more suitable to vegetative growth. Also, soil permeability and infiltration rates should be increased with topsoiling and surface manipulation.

Page I-653

There is no evidence that ground water will be used for mining beyond the recharge capacity of the

aquifers in the area. Also, the aquifer capacity in the area exceeds the projected demand. Therefore, subsidence due to use of ground water should not be charged as an adverse impact of mining.

Page I-655

Stating that vegetation on 14,000 strip-mined acres will be temporarily destroyed by 1990 does not give proper credit to revegetation that will continuously be done in 15 years of mining.

Reclamation activities are being successfully carried out in Montana and Arizona under climates similar to those in the Wyoming study area. Fifty years for natural plant succession will only be required if the mine spoils are abandoned (see the National Academy of Sciences report "Rehabilitation Potential of Western Coal Lands" (page 58).

Pages I-666,
667, 668

The following absolute statements, together with the well-prepared outline of projected demands in Chapter V of Part I, combine with the glaring omission of mitigating measures to produce an imbalance of evidence, an unwarranted sense of gloom that biases the reader toward the conclusion that people's needs cannot and will not be met if regional coal development proceeds as hypothesized.

"There will not be enough physicians, dentists, professional nurses and other social workers to meet the demand." (Health and social services, page I-666.) VII-418

"Treatment facilities will unavoidably be unable to meet the projected demand." (Water, page I-667)

"Collection and treatment facilities for Douglas and Gillette will be overutilized by 1980."

(Sewer, page 668)

It is unreasonable to list adverse socio-economic effects which "cannot be avoided" without considering available mitigating measures. (see comment on Chapter VI, Page I-612.)

Page I-673

The projected land productivity loss of 50 percent appears far too high. Studies have shown an increase in productivity after reclamation of strip-mined lands.

Page I-675

Arbitrarily, and without considering mitigating measures, the draft proposes restricted development as a means "to enable the community to plan and develop needed housing, educational and social services in advance of need rather than after these facilities have already become inundated and overcrowded." It should be pointed out that the overcrowded conditions described in the environmental impact statement, i.e., the inadequacy of existing supply in comparison with future projected demand -- do not represent totally unavoidable adverse impacts and should not be accepted without qualification as decision factors for consideration of alternatives to the proposed actions.

Page I-689

Highwalls should only have to be fenced if highwall reduction is not used.

Page I-700

Even if all the coal produced from the Powder River Basin were gasified, railroad facilities would still be required for material transportation both to and from each gasification plant. The ammonia, phenols, benzene, oil and tars, etc. will have a market and will require transportation facilities.

Page I-868

The statement that subsidence will occur if large quantities of water are pumped from an aquifer should be qualified to indicate that excessive pumping can be avoided if the need arises.

Volume IV, Part V

Page V-1 Change 4,192 acres to 4,960 acres

Page V-3 Surface and coal ownership should be revised as follows:

	<u>Surface</u>	<u>Coal</u>
U. S.	640 acres	4,352 acres
Kerr-McGee	320 acres	0 acres
Others (private)	<u>3,392</u> acres	<u>0</u> acres
TOTAL	4,352 acres	4,352 acres

Central Louisiana Electric Company should be added to the list of purchasers of Kerr-McGee coal.

Page V-4 Change "mine stripping" in the first sentence to "overburden removal."

Page V-5 (Figure 2) notes only one of the federal coal leases. W-24710 should be included.

Page V-8 Change soil material removal to topsoil removal.

Page V-9 Rehandling of overburden will vary depending on equipment and overburden characteristics. A 35 percent rehandle factor is not always correct. Suggest the words "of approximately 35 percent" be deleted from the last line.

Figures 6 and 7, Chapters III, Part I show a drag-line which is not included in Kerr-McGee's plans. If a figure is to be included, it would best be placed in Part V and only a truck-shovel system shown.

Otherwise the paranthetical remark referring to Figures 6 and 7 should be qualified by adding the words "(Somewhat similar to but without the dragline)."

Suggest the following paragraph be inserted just before the last paragraph: "Use of wheel-tractor scrapers for overburden removal would require equipment for service, maintenance and coal removal operations of approximately the same size, type and quantity as used for truck-shovel and dragline operations."

Page V-11

Delete "Each cut would be opened from the east and moved to the west."

Page V-12

The discussion of the alternate coal handling system is unclear. Suggest the second and third and fourth sentences of the first full paragraph and the first sentence of the second paragraph be combined by stating: "Coal will be loaded onto trucks by either a front-end loader or shovel and hauled to the crushing facility."

No open storage will be used. Therefore, the last sentence of the second full paragraph should state, "Coal will be stored in silos prior to loading into unit trains."

Page V-13

Delete "one or two fill areas will be fine graded at a time while the fill area closest to active mining will be left unfinished to avoid interfering with mining." The sentence refers to dragline stripping only.

In the second paragraph, delete: "and will provide the greatest degree of flexibility in creating desired land topography."

Add the following statement after the last paragraph describing final disposition of haul roads: "Buildings and other surface facilities not used for ranching will be removed and the areas reclaimed."

Page V-14

The ditch section, Figure 11, Chapter III, Part I should have variable bottom widths with a single scraper width as optimum. Ditch hydraulics should be design criteria. Therefore, the third paragraph should be changed to read: "...will be constructed generally as shown in Figure 11 ..."

Page V-16

The second sentence should be changed to read: "Rail-road grades will be maintained at a maximum grade of one percent."

Apparently, there is a typographic error in the first sentence of the second paragraph as "will be required" is repeated two times.

Also, electric power will be required for pit drills, mine dewatering pumps and other electric-powered mining equipment. Therefore, suggest the words "and other electric powered equipment" be added to the first sentence of the second paragraph.

Page V-17

The heading of the list of equipment should be changed to "Dragline or Shovel-Truck System" since some of the equipment will be used for either system. Also, since the "Use" column explains what the equipment is used for and the asterisks are incorrectly applied, delete the asterisks and the note to which they refer.

"Truck-mounted Pit Drills" should be changed to read "Track-mounted Pit Drills" and "Wheel Tractor Scrapers - size 24 cu. yd." should be changed to "Wheel Tractor Scrapers -- size 24-35 cu. yd."

Page V-18

Delete the title "Dragline System, since this is now merely a continuation of the table on the preceding page.

Outside coal storage will not be used. Therefore, change first sentence under "Storage Facilities" accordingly.

Page V-19

Reference to Figure 6 should be to Figure 8, Chapter II. The following sentence should be substituted for the second sentence under "Monitoring:" "Ten hydrologic monitor wells have been completed on the lease."

Page V-27

The last sentence of the first paragraph which reads, "Detailed soil inventories must be conducted on the lease area and adjacent lands in order to properly evaluate impacts on the land and the relationships to the existing environment." should be deleted because it is an unwarranted conclusion. The ultimate impact on the land will be determined by Kerr-McGee's operations, and operational decisions will necessarily be based on more detailed soil investigations as operations proceed.

Page V-41

The word "northeastern" should be changed to "northwestern."

Page V-46

The number "7" in the sentence, "An interruption to this trend occurs in sections 3 and 7 where a slight warping produced an east-west trending syncline of very small magnitude." should be changed to "11."

Page V-81

The statement: "About 35 antelope have been living on the lease area. Their numbers have been decreasing slightly due to the human activity on the lease area." implies that close measurement of antelope activity in this specific area has been carried on for some time and that the cited correlation between this activity and human activities can be proven. A more accurate statement would be: "It is estimated that about 35 antelope could have been living on the lease area and that their numbers have been decreasing slightly."

Page V-87

The last sentence of the second paragraph should be changed to read: "At the historical productivity rates, a total of 1,118 AUM's will be temporarily lost to mining but productivity will be improved from mining reclamation."

Page V-88

Show Jacobs Land and Livestock Company as controlling 2,518 acres instead of 1,878 acres. Delete McKinzie's 604 acres.

The statement: The only reliable method of obtaining a crop is with irrigation." implies that revegetation in this area can only be accomplished with irrigation. To clarify this point, the statement should be: ".... a commercially salable crop in this area ..."

Page V-93

Change 4,352 acres to 4,960 acres in the second sentence and delete the words "to be mined."

Page V-94

The estimated life of the mine is 25 years, rather than the 22 stated. The sentences on lines 3-6 should be changed to read: "Production will increase to 15.9 million tons per year in 1982 and not exceed this rate for the remainder of the mine life. At the peak production level, an estimated 160 acres and 30 million cubic yards of overburden will be disturbed per year." An estimated 619 million cubic yards of overburden will be handled over the life of the mine, instead of the 270 million yards noted.

Page V-97

Change the third sentence of the second paragraph to read: "The topography after removal of coal could be as shown in Figure 2."

Page V-99

Figure 2 shows the results of dragline stripping. Therefore, the word "possible" should be inserted before the word "Topography" in the title.

Page V-100

The first and second paragraphs do not accurately describe either the existing topography or the options after mining. The following paragraphs should be substituted:

North Prong Creek will be diverted and altered to a minor extent. Its present, shallow, steep-sided, meandering channel will be changed somewhat and the new channel of the creek may appear to be flatter and straighter after mining.

If the topography is as shown in Figure 2 at the completion of mining, the remains of the highwall will be visible on the north side of the mined area. The highwalls as illustrated in Figure 2 have not been reduced so this mine pit will create a long, narrow, trough-like depression which can be used as a reservoir and will probably be the most visible indication that the topography of the area has been altered.

The sentence: "It could result in bringing material to the surface which may be toxic (boron) to plant growth" is a double presumption without substantiation and should therefore be deleted. No toxic material exists in the overburden, according to completed analyses. Also, the company's reclamation plan indicates that all toxic material will be buried.

The sentence: "As all physical, chemical, and biological systems will be disrupted to an unknown degree, the overall result of mining action, undoubtedly will be lowering of soil productivity." is also an unproven presumption that should be deleted. Dr. Morton May of the University of Wyoming and Robert Lang, Professor of Range Management both testified at the public hearing in Casper that the results of raising cattle on the reclaimed land at the University experimental station near Gillette indicated a gain of 39 to 46 percent more pounds per acre.

The first sentence of the second paragraph should be corrected as follows: 270 million cubic yards of overburden should be 619 million cubic yards and the 22-year life of the mine should be changed to a 25-year life.

Page V-102

Construction of mine facilities will not permanently remove 200 acres of soil from productivity because, after mining is completed, the company will remove facilities not usable for ranching operations and reclaim the area. The first full paragraph should be corrected to indicate this fact.

The paragraph, starting at the bottom of page V-101 and describing possible effects of alteration of the channel of North Prong Creek is unduly alarmist because the North Prong Creek will have only a very minor realignment. The following sentence should be added to the end of the paragraph (page V-102):

"However because only minor realignment of the creek channel is planned, the impact should be negligible."

Page V-103

Central Louisiana Electric Company should be added to the list of purchasers of Kerr-McGee coal.

The life of the mine should be shown as 25 years.

The removal and consumption of the estimated 300,000,000 tons of coal and its subsequent use to supply the nation's energy needs during the operating period of the Jacobs Ranch mine far outweighs the probable impact of the loss of 2.4 percent of the strippable coal reserves thus far identified in Converse and Campbell Counties, Wyoming. The benefits to the state of Wyoming to be derived from the mining operation,

as well as the supply of additional energy resources for nationwide consumption, will be timely and beneficial to all concerned during this period of anticipated energy resource shortages. The coal reserves to be mined can be replaced by the development of additional reserves mineable with advanced technology, that is, replacement will come from areas not now considered mineable due to present economics and mining methods.

The statement is made that "small amounts of sand and gravel potentially useful for aggregate" could be lost along North Prong Creek. Since the amounts of sand and gravel which could be lost are small and since large amounts of sand and gravel for aggregate purposes will need to be imported, as discussed in Part I, Chapter V, the impact of possible loss of these "small amounts" of sands and gravels would be minimal, rather than "critical" as indicated in the next to last paragraph.

Overburden yardage should be shown as 619 million cubic yards and life of the mine as 25 years.

The following sentences should be added to the first paragraph to give balanced coverage: "No aquifers are known to discharge into streams on the Kerr - McGee property and the North Prong Creek will have only a minor realignment."

The assumption should not be made, as indicated in the fifth paragraph, that "even upon revegetation, the productive capacity will be reduced 50 percent of previous capacity." As we have commented earlier, this statement has been refuted by the testimony of Dr. Morton May and Dr. Robert Lang during the public hearing in Casper. Also, during the public hearing in Gillette, John McGee, a rancher in the area of the Amax coal mine, testified that the wildlife population on his ranch and in the area of the mine has increased and that grasses on revegetated land are showing better quality and quantity than those on undisturbed land.

Page V-105

32 Spoils are more permeable after mining if the surface is treated properly through topsoiling and manipulation. Therefore, the beginning of the paragraph under the title "After reclamation" should be changed as follows: "Replacement of spoils into the pit could result in deposits with reduced permeability but spoils are more permeable after mining if the surface is treated properly through topsoiling and manipulation. With improper treatment, reduced permeability may ..."

Page V-108

The second sentence of the last paragraph should be changed to: "This will increase to an estimated 160 acres when mining is at the rate of 15.9 million tons per year beginning in 1982."

Page V-109

The discussion of toxic material should be balanced by adding the following statement at the bottom of the page: "However, Kerr-McGee has indicated that according to completed analyses, no toxic material is expected to exist in the area being considered and, if any is discovered, it will be buried."

The first sentence should be changed to indicate that vegetation will not necessarily be permanently removed on the acreage used for mine facilities because plans are to remove mine facilities which are not useful for ranching and reclaim the land.

Page V-110 **32** The partial paragraph at the top of the page refers to a "Part I, Chapter III, "Reclamation of Mined Lands," which is not in the draft impact statement. Also, the negative inference against successful reclamation is unsubstantiated. Therefore, this partial paragraph should be deleted .

Page V-111 The figure 270 million cubic yards should be changed to 619 million cubic yards.

Page V-113 The life of the mine is 25 years, not 22 years.

Page V-115 The figure "231 acres" should be replaced with the figure "160 acres." Also, the year "1979" should be replaced with the year "1982."

The sentence: "In all probability the increased human activities and noise associated with mining operations will disturb and cause the major wildlife species to leave the area prior to destruction of the habitat." is not supported by the evidence and should be removed. Testimony by a representative of EXXON Highland Uranium Mine indicated that animals do not leave the unchanged area during mining operations and that during the hunting season the animal population increases in the area of the mine.

Page V-116 The statement, "An estimated 278 acres of habitat, including that associated with construction of mine buildings and increased population will be permanently lost." is not correct. Portions of this area will be reclaimed (see comment on page V-109).

32 The last sentence of the next to last paragraph referring to the possible "elimination" of the elk herd "usually located to the east of the leased area" because of noise and human activity is an exaggerated conclusion based on two unproven presumptions. The last sentence should therefore be deleted.

The statement: "No satisfactory evidence is presently available which would suggest that strip mined areas can be satisfactorily revegetated with plant communities that will satisfy needs for deer or antelope." is contrary to experience with mining operations in the state of Wyoming, including Kerr-McGee's Shirley Basin operation, where antelope have been seen grazing on revegetated land.

Page V-118

Add the following sentence to the last paragraph:

"Also, the Jacobs Land and Livestock Company will use the inactive portion of the lease for grazing purposes while the mining operation is in progress."

Page V-121

Delete the third sentence of paragraph two and substitute: "Covered storage will be used for coal and the length of time that coal will remain in storage will be minimized." Also, add: "Dust collector

systems will be used on the overburden drills."

It should also be noted in this discussion of "mitigating measures" affecting air quality that water systems and dust suppression systems will be used wherever possible to keep air pollution to a minimum; that pollution will be confined to a relatively small area in the mine vicinity, and that every reasonable effort will be made to keep accidental coal fires to a minimum to prevent loss of coal as well as in the interests of air quality.

Page V-122

Last two paragraphs contradict each other. Delete the last paragraph.

The highwall plan should be stated as it is on page V-13, next to last paragraph.

Add the following statement to the end of the second paragraph: "Grading and shaping will include methods of water retention and erosion prevention such as scarifying, ripping and discing."

Page V-134

Mitigating measures for recreation are not discussed as a separate section in Chapter IV although the Table of Contents indicates that they will be. A separate section on recreation should be included.

Page V-135

It should be noted in the mitigating measures for agriculture that Kerr-McCee is planning to use a truck-shovel operation which will allow rapid reclamation and revegetation.

- Page V-136 **32** It should be noted that existing public access roads will be maintained as mining progresses throughout the affected area. This will be accomplished through scheduled relocation of roads in cooperation with state and county highway officials as well as local residents. Construction of relocated roads will reflect existing state and county design and construction schedules and specifications.
- Page V-137 Change 231 acres to 160 acres. Change 22 years to 25 years.
- Page V-139 Change the last sentence to read: "Some change in the drainage channel of North Prong Creek cannot be avoided, but the realignment will be minor."
- Page V-140 The statement: "Reduction of soil productivity, permeability and infiltration rates are unavoidable." has been refuted, with respect to productivity, by Dr. Morton May and Dr. Robert Lang (see comment on page V-101). The statement should be altered accordingly.
- Page V-141 Same comment as first paragraph of comments on page V-103.

There should be no permanent loss of vegetation on the 278 acres, of which 200 acres are mine facilities and 78 acres are housing units, because acreage not used after mining is completed will be reclaimed. The first sentence should be changed accordingly.

The statement that a "50 percent loss in productivity has been projected" is inconsistent with the findings of the University of Wyoming experimental station near Gillette that reclaimed land increases cattle production from 39 to 46 percent.

The statement in the last sentence that the entire elk herd may be lost is an unsupported assumption that goes far beyond the context of Chapter V, i.e. "Probable Adverse Environmental Effects which cannot be Avoided." Therefore, the sentence should be deleted. Also the statement: "The permanent removal of 278 acres of habitat will be unavoidable." is inconsistent with the plans for reclamation. See comment on page V-143.

The statement: "Reduction of an estimated 50 percent in carrying capacity after reclamation cannot be avoided." is inconsistent with the findings of the University of Wyoming studies. See comment on Page V-101.

The statement: "Destruction of grazing pasture (4,352 acres) and the necessity of the rancher having to provide grazing elsewhere is unavoidable." suggests that all land will be non-productive for the life of the mine. However, a maximum of 350 acres will be undergoing mining and reclamation at any one time. The statement should be changed accordingly.

Also, the statement: "The added economic cost of having to provide new water sources for livestock cannot be avoided." does not necessarily follow projected events. More water sources may be available for livestock after mining than before because of the nature of the topography anticipated from reclamation activities.

Add the statement: "For the quantities and tonnages to be moved throughout the mine life and the distances involved, truck transportation is estimated to be so costly that it is not an economically viable alternative."

Page V-159

The life expectancy of the mine is 25 years.

Page V-160

The first sentence of the second full paragraph should be changed to read: "At maximum production, 160 acres per year will be disturbed by mining and 190 acres will be undergoing reclamation at any one time, for a maximum total of about 350 acres.

After reclamation, grazing production will not be reduced 50 percent nor should the reclaimed land lose productive capacity (see comment on pages V-143 and V-148). The last two paragraphs should be changed accordingly.

Page V-161

The statement: "Wildlife habitat for those animals which depend on the sagebrush type habitat will be destroyed for a period of 20-50 years." is inconsistent with the experience in Shirley Basin where sagebrush is beginning to revegetate naturally after only two or three years.

Page V-163

The estimated life of the mine is 25 years, instead of 22 as indicated.

Page V-164

Annual forage production will not be lost on 300-500 acres annually. An estimated maximum of 350 acres will be undergoing mining and reclamation activities at any one time and this acreage will not be cumulative.

July 20, 1974

State Director
Bureau of Land Management
Cheyenne, Wyoming

General Selwyn
Southbank, B.C.
Canada

Dear Mr. Baker,

My husband and I have just read a portion of the Powder River Basin Environmental Impact Statement, and also Mr. Bart Koehler's notes on the adverse environmental impacts of the project. It is in our opinion that this statement is incomplete and far from adequate.

The damage to air, water, soil and living things must not be considered "unavoidable". They are only "unavoidable" as long as people don't care. We understand that the coal must be used, but the methods of energy conversion should be looked into more carefully. If it's going to take more time and money to develop ways to safely make the conversion, then it is in the interest of environment that we do so. After all, we have to live in those places even after they are strip mined.

My husband and I live

in North eastern Colorado, North of Greeley.
So this matter is of great interest to us.

We understand that in Montana and North Dakota, the people are defending an export policy. We urge that Wyoming do the same.

If there is not more time spent in learning better conversion, no matter what state it's in, everyone will lose. Also with the money these coal companies bring in, they should help the state return the land to its natural state as much as possible. We hope Wyoming makes a wise and careful decision concerning the Powder River Coal Basin.

Thank you,

Mr. & Mrs. Richard J. Ball

34

BLACK HILLS POWER AND LIGHT COMPANY

P. O. Box 1400

RAPID CITY, SOUTH DAKOTA 57701

ROBERT G. ASHEIM
PRESIDENT

TELEPHONE
(605) 348-1700

July 30, 1974

State Director
Bureau of Land Management
Wyoming State Office
P. O. Box 1828
Cheyenne, Wyoming 82001

Gentlemen:

We have reviewed the draft environmental impact statement on the development of coal resources in the Eastern Powder River Coal Basin in Wyoming. A representative of our Company also attended the public hearing in Gillette on June 27.

Enclosed are Black Hills Power and Light Company's comments submitted for your consideration.

Sincerely yours,

Robert G. Asheim

RGA:vh

Enclosure

Comments on Draft Environmental Impact Statement on Development of Coal Resources
in the Eastern Powder River Coal Basin of Wyoming - Gillette, Wyoming -
June 27, 1974

My name is Robert G. Asheim. I am President of Black Hills Power and Light Company and President of its wholly-owned subsidiary, Wyodak Resources Development Corp. My office is at 625 Ninth Street, Rapid City, South Dakota.

We have reviewed the Draft Environmental Impact Statement, and for the most part found it to be a very thorough and well prepared report. However, we want to call your attention to a number of errors, all in Volume IV, as set forth below:

1. Throughout the report, our coal mine is referred to as Wyodak Resources Development Corporation. Please change to Wyodak Resources Development Corp.
2. On Page VI-1, fourth line, please add "wholly-owned" preceding "subsidiary of the . . . "
3. In tabulation on Page VI-4 in first column (entitled "Surface") the figure following Wyodak should be 280 and the total 440. In the last column (entitled "Coal") the figure following United States should be 240 and that total 440.
4. Page VI-6, first line in second paragraph, change location to "NE $\frac{1}{4}$ SE $\frac{1}{4}$ of section 28 . . . " Same page, last line change "380" to "450."
5. Page VI-7, heading in tabulation should be changed from "Million Tons" to just "Tons."
6. Page VI-10, third paragraph, third line, change to read " . . . additional drop-bottom or end dump trucks . . . "
7. Page VI-10, fourth paragraph, third line, and Page VI-14, fourth paragraph, fifth line, change silo size from 14,500 tons to 15,200 tons.
8. Page VI-17, tabulation, last column, following "front-end loader" change Hough "700" to Hough "400." Following 70-ton trucks, name in last column should read "Caterpillar '768'."
9. Page VI-23 "general" is misspelled.
10. Page VI-30, second line should read " . . . upper bed averages 52 feet thick and the lower about 32 feet thick . . . " (These figures are reversed.)
11. Page VI-30, second line from the bottom, figure should be changed to "40 million tons."
12. Page VI-31, first paragraph, change figures to read " . . . and a weight of 1,742 short tons per acre-foot . . . federal lease would be 34,969,000 short tons . . . thick coal in the south pit area (24,412,000 short tons) . . . reserve of coal would be 59,381,000 short tons . . . mined out

leaving a remaining reserve of 52,798,000 tons . . . coal reserve in the south pit area is about 50,158,000 short tons . . . "

13. Page VI-31, add the following to the end of the first paragraph. " . . . assuming 95 percent recoverability, if total area were continuous without areas of burned out coal which amount to approximately 10,000,000 short tons."
14. Page VI-31, second paragraph should read "Federal coal lease . . . 80 feet of coal and the same weight, 1742 tons per acre-foot . . . area of the north pit is 11,101,000 short tons. About . . . remaining reserve is 10,223,000 short tons; remaining recoverable reserve is 9,712,000 short tons . . . "
15. Page VI-38, under "Water Use," second paragraph, first line, change "cooling towers" to "condenser cooling."
16. Page VI-54, first paragraph, fifth line should read " . . . acres in the mining plan, Homestake Mining Co. owns 1,200 acres, Wyodak owns 280 acres, the State of Wyoming owns . . . "
17. Page VI-54, second paragraph, third line, change "Wyodak" to "Homestake Mining Co."
18. Page VI-54, third paragraph, third line, add at end of sentence " . . . owned by Wyodak and Homestake Mining Co."
19. Page VI-61, third line, "30-megawatt" should be changed to "20-megawatt," and on line three of the first paragraph under Air Quality, "30-MW air cooled" should read "20-MW air cooled." Also, Page VI-14, second line, change "30-MW Neil Simpson plant" to "20-MW Neil Simpson plant."
20. Because the new 330 MW plant will have the necessary pollution abatement equipment, it would seem that the emissions listed on Page VI-63, resulting from a plant "without controls," are totally misleading and we would suggest that they be deleted.
21. Page VI-69, first line of new paragraph, change "345 KV" to "230 KV."
22. Page VI-79, second paragraph, 7th line, change "more" to "79 acres of."
23. Page VI-90, under "Farming," we suggest that paragraphs 3 and 4 be deleted and the following substituted: "The area adjacent to the mining operation is mostly ranch land. For many years a very satisfactory relationship has existed between the mining operation and the ranches over fences, livestock control, access to ranching areas, etc."
24. Page VI-92, second paragraph, change "\$25 million" to "more than \$160 million."

In addition we call your attention to the tabulation on Page I-135 pertaining to emissions from the Neil Simpson Station. These figures are incorrect. Correct

information is contained in the Environmental Report, dated May 1973, which was prepared by Black Hills and Pacific Power & Light Company and submitted to the Wyoming Public Service Commission in connection with our application to construct the 330 MW generating plant at Wyodak, adjacent to the Neil Simpson Station.

We also direct your attention to Volume II of the "Regional Analysis," Pages I-462 through I-464. On Page I-462, the Neil Simpson Station at Wyodak will not be "converted" to 330 MW. The 330 MW generating station is a completely separate project and will be constructed by Black Hills and Pacific Power & Light Company adjacent to the existing Neil Simpson Station.

We certainly feel that the phrases, "assuming no stack emission controls," "without emission controls," "estimated uncontrolled yearly emission," and again "uncontrolled emissions" should all be deleted from your report inasmuch as they are completely misleading. No plant will be constructed without the proper emission control equipment in compliance with state and federal EPA regulations. You have touched on this briefly in the report on Pages VI-15 and VI-115. We again direct your attention to the Environmental Report, dated May 1973, prepared by Black Hills and Pacific Power & Light Company, and submitted, as Exhibit C, with the application to the Wyoming Public Service Commission for permission to build the new 330 MW generating station at Wyodak. Part VI of this report spells out in detail the "affirmative measures" which will be taken in the construction of the new plant to protect the environment and to conform with state and federal standards. The existing units at the Neil Simpson Station will be either retired or brought into conformance through the installation of pollution abatement equipment.

We urge you to revise Table 1 on Page I-464 assuming all new plants with emission controls.

In summary, we believe that this Environmental Impact Statement will be a source of valuable information for future planning of the area's resources. This is why we have pointed out errors and misleading statements, because the material must be as accurate as possible in order to be used effectively. We believe the corrections and suggestions we have given will help you to draft a more accurate, realistic statement.

Robert G. Asheim
President
Black Hills Power and Light Company
and
Wyodak Resources Development Corp.

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**ENVIRONMENTAL
DEFENSE
FUND**



1130 CAPITOL LIFE CENTER
16th AT GRANT ST., DENVER, COLORADO 80203/303 623-8165

July 31, 1974

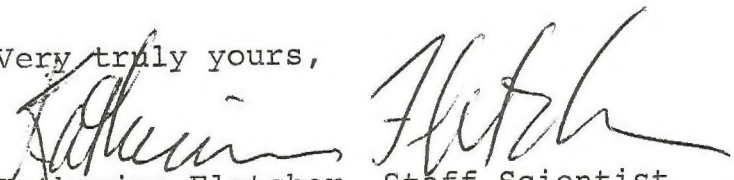
Daniel Baker
State Director
Bureau of Land Management
Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

Enclosed are this organization's comments on the
Draft Environmental Impact Statement, Development of Coal
Resources in the Eastern Powder River Coal Basin of Wyoming.
I would request that these comments, in their entirety, be
included in the Final Environmental Impact Statement.

We would also appreciate being informed of the schedule
for revision, as soon as it is known. Thank you for your
assistance in these matters.

Very truly yours,



Katherine Fletcher, Staff Scientist
Rocky Mountain/Great Plains Office



COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT,
DEVELOPMENT OF COAL RESOURCES
IN THE EASTERN POWDER RIVER COAL BASIN OF WYOMING

Submitted by

Katherine Fletcher

Rocky Mountain/Great Plains Office

Introduction

In recent years, it has become increasingly obvious that large scale development of the coal resources of Wyoming and Montana would entail massive adverse environmental impacts. The policy of the federal government has in the past been directed primarily toward encouraging and facilitating such regional development (for example, the North Central Power Study) or, frequently, not directed at all (for example, patterns of federal coal leasing). The Northern Great Plains Resource Program represents the first attempt by the federal government to grasp the implications of large scale regional energy development in the Northern Great Plains.

Unfortunately, the present draft environmental impact statement, Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming (May 31, 1974), appears to reinforce the federal government's by-now traditional acquiescence in and unquestioning acceptance of industry's plans to exploit the public's resources.

Scope of the EIS

The draft EIS under consideration here purports to be something more than a narrow, site-specific environmental impact analysis. Before its issuance, it was speculated by some that this EIS might attempt true regional analysis of coal development impacts, at least for a portion of Wyoming. Though it falls far short of those expectations, the authors

clearly recognized they had analytical obligations which could not be fulfilled by separate NEPA statements on the five discrete proposals discussed in this EIS.

But recognition of the need for scope is not carried into practice in the EIS. In this critical dimension, it emerges as hasty, arbitrary in included and excluded areas, and piecemeal in coverage. If the EIS were intended to contribute to rational, regional decision making, one would have expected it to be both comprehensive and thorough in scope, which it certainly is not. At the outset, the authors admit that the proposals analyzed in the EIS do not include several specific proposals which are even now well publicized:

"Subsequent to the administrative definition of scope of the present EIS, four additional mining and reclamation plans or letters, indicating an intent to mine coal in the near future, were received by the Geological Survey."
Page I-5.

Clearly, the undue haste in which the statement itself was prepared also belies any contention that the document is intended to provide a basis for sound decision making.

Also, certain schizophrenia pervades this statement. It vacillates between extremes of generality and specifics, failing comprehensiveness at either end of the spectrum. There is no indication that this analysis will assist the government in overcoming the dangers of piecemeal decisions.

Federal Decision Making and This EIS

One is left to wonder, considering both the "crash" schedule for completion of the statement and the severe limitations in its scope, whether this statement will have any effect on the proposals discussed. The dispatch with which alternatives are dismissed reinforces this skepticism, further enhanced by the assertion that the federal government is in fact unable to exert rational control over federal coal development; in dismissing the sound alternative of phasing coal development to fit the region's social/economic/environmental ability to absorb it, the EIS states:

"the practicability of this alternative is limited by the Federal Government's inability to implement staging or [sic] development without special Congressional authority." Page I-675.

Something has gone seriously wrong if the federal government is either unable or unwilling to assert any control over massive coal development in the Northern Plains.

This EIS demonstrates that the Northern Great Plains Resource Program is largely irrelevant to the course of federal government coal policy. Not only is the timing of an impact statement such as this inappropriate with respect to the NGPRP timetable, but also, as indicated on page I-32, the "forecasts" of the NGPRP hopelessly underestimate the magnitude of development openly anticipated in this EIS. It is clear from the information presented in this EIS (however incomplete and confusingly portrayed) that even the "extensive development" forecast of the NGPRP could be exceeded in the Eastern Powder River Coal Basin of Wyoming.

Conclusions of the EIS

The greatest fault of the statement is the authors' underlying assumption that the proposed developments will occur, regardless of their impact. Though the conclusions of the EIS follow closely the desires of the private companies involved, the analysis itself is not a total "whitewash." Many specific and general adverse impacts are freely admitted in the EIS, including the following:

"Development of coal resources in the Eastern Powder River Coal Basin of Wyoming will produce a region completely different from that existing at present." Page I-859.

With respect to the ARCO proposal, it is stated:

"Mining of this area will involve a long-term loss in productivity. Under the climatic conditions which prevail for this area, the area may never regain its present productive capacity." Page III-167.

Severe impacts on water resources (surface and ground), on agriculture, on air quality, on communities and on natural ecosystems are all admitted in varying degrees of detail. Despite its minimizations of impact and its many gaps in analysis, the overall effect of this EIS is to leave grave doubt as to the advisability of the proposed courses of action in the mind of the reader.

The Role of Western Coal

The authors clearly fail to put proposed development of Powder River Basin coal in the broader perspective of the national energy situation or even the national coal picture. Even the elementary fact that most western coal, because of its low heat content, is not low enough in sulfur to meet air quality regulations has escaped the authors' awareness. Instead, they have accepted the line of reasoning which justifies widespread rapid western coal development on the basis of the need to meet air quality standards:

"The majority of the coal to be hauled by the railroad is for shipment out of state to midwest and eastern points of demand. The basin coal is low in sulfur content and is required by these power plants in order to meet current EPA and state air pollution regulations. Without this coal these power plants will need to obtain coal of higher sulfur content from other areas of the nation. Use of coal with a higher sulfur content will result in increased air pollution in the power plant areas, or inability to supply the electrical energy demands of their service areas with resultant environmental impacts created by lack of power, blackouts and brownouts." Pages II-163-4.

The table on page I-180 demonstrates the important relationship between heat content and sulfur content in western coal. Yet the authors do not point out the striking consequences of this factor. It should be noted that a recent administrative decision in Nebraska concluded that coal from the ARCO mine considered in this EIS was not of sufficiently low sulfur content to meet air pollution regulations.

Coupled with this "low sulfur myth" is the fact that significant quantities of truly low sulfur coal exist in the eastern United States. It appears that the ability to acquire large blocks of coal, particularly federal coal, the opportunity to escape labor problems in the east, and the welcoming attitude of the Wyoming state government are the real factors attracting the energy companies to the Powder River Basin. But these factors are not assessed.

It is clear from this EIS that the federal government is encouraging this shift of the coal industry from the east to the west, yet such encouragement may not be the appropriate policy for the federal government: High transportation costs, passed on to the consumers, large influxes of people to areas ill-suited for dense population, air pollution in an area valued for its clean air, heavy demands on water in an arid and semi-arid region - problems the EIS admits - would be the inevitable result of approving the subject permits. For justification the federal government is relying solely on industry information and its own "gut feeling." And this EIS fails to advance the analysis beyond these two "sources."

The companies clearly have their own motivations for pursuing the proposed developments. For example, the Burlington-Northern Railroad is clearly interested in the vast revenues which would accrue from shipping western coal long distances. This does not mean that ICC approval of the proposed Gillette-Douglas line makes public policy sense. Statements of George R. Powe, Assistant Vice-President for Commodity Marketing for Burlington-Northern, in a recent issue of Mining Congress Journal, indicate the delight with which the railroads view booming western coal development . . .

"Last December our company economists revised coal traffic forecasts upward. They say our coal traffic will bring revenues of \$127 million in 1974 instead of the \$103.4 million estimated earlier. They see coal transportation revenues of \$135 million to \$140 million in 1975 with a better than even chance that the dollar volume of that traffic in 1976 will be closer to \$200 million than the \$174 million forecast earlier. Coal movement should continue its upward spiral, reaching at least \$330 million in 1982. And there's a good chance that the figure could go much higher."

. . . and the absurdity of some long distance shipment schemes:

". . . western coal will move by rail and barge to power plants in the Middle West and East, even to West Virginia, the nation's major coal producing state." (emphasis added)

At least the EIS admits the "vast" expenditures of diesel fuel (one of our fuels in tightest supply) necessary for long distance coal transport. Page II-181. But the authors do not provide any sound rationale for "bringing coals to Newcastle."

Water Resources

The impact of coal development on water resources is one of the most complex and troubling problems associated with proposals for developing the Powder River Basin of Wyoming. The EIS discusses schemes for massive diversions of water from the Yellowstone River Basin to the Gillette area. Pages I-266, 267. Mention is also made of the possibility of importing water from the Green River Basin. Page I-267. The potentially enormous impacts of such trans-basin diversions are not even mentioned, let alone analyzed.

In addition, the discussion of water quantities is inconsistent and confusing. On page I-55, it is stated that the estimated water demand for the "study area" is approximately 50,000 acre-feet per year by 1990. If the authors had examined the water contracts and applications even of the few companies whose proposals are considered here, they would quickly have realized how low their water estimate is. Of the four companies whose proposals are specifically analyzed in this statement, ARCO has applied to the Bureau of Reclamation for 100,000 acre-feet per year of water for use in Wyoming; Carter (in the name of Exxon) has a contract from the Bureau of Reclamation for 50,000 acre-feet of water per year; and Kerr McGee has a contract from the Bureau of Reclamation for 50,000 acre-feet per year. Of the three additional companies peripherally considered in this statement, Sun Oil Company has a contract for 35,000 acre-feet per year from the Bureau of Reclamation for use in Wyoming; Panhandle Eastern Pipeline Company has a contract for 30,000 acre-feet per year from the Bureau of Reclamation for use in Wyoming; as does AMAX. These figures do not include water rights that these companies may have obtained privately or through the state, nor do they include water contracts or applications from the Green River or from the North Platte River.

Since the Bureau of Reclamation guards rigorously against providing water for speculative purposes, one can only assume that at least this federal agency assumes that the water will be used for coal development. It is therefore inexplicable and inexcusable that this EIS does not consider the impacts of supplying these vast quantities of water. In addition, of course, the use of this water implies far more coal conversion (gasification, liquefaction and/or electrical generation) than is suggested by the authors of this statement.

To indicate the potential magnitude even of non-federal water supply possibilities, the authors of the EIS do state:

"Coal development could impact present water rights and unappropriated water amounts. Industrial companies have already purchased over 12,000 acres of irrigated lands with the intent of having the attached water rights changed from irrigation to industrial uses. Requests have been filed with the State Engineer for changes involving one million acre-feet of water." Page I-501.

But the potential impact of such water right transfers is not discussed.

We note that the Bureau of Reclamation has declined thus far to analyze the environmental impacts of supplying industrial water. It is unfortunate that the agencies involved in this EIS have determined also that the environmental impacts of using water for coal development are not worthy of analysis. This can only mean that the agencies feel that sound decisions can be made in the absence of this analysis.

Other Adverse Impacts

The authors of the EIS are fairly candid about the severe impacts of stripmining:

"aquifers will be permanently removed by mining." Page I-868.

"Mining activities will destroy the existing drainage patterns in parts of the area."
Page III-107.

In addition, contamination of groundwater by sewage is anticipated (Page III-109), and water pollution from mining is expected (Page I-499). The legal aspects of such damage are not, however, discussed.

Similarly, air quality degradation is admitted to be a foregone result (see, for example, Pages I-466, 467, I-647), without reference to the legal requirement of "no significant deterioration," or even of air quality standards for that matter.

Notable among the gaps of analysis in this EIS is the lack of information on trace elements and the impacts of trace element pollution of water and air. Some of the coal quality data indicate that trace elements are indeed a significant potential problem. Yet the authors appear not even to have made use of research currently being performed by the U. S. Geological Survey on this point. Given the enormous public health implications, it seems clear that this should be a priority area of research and analysis, before major policy decisions encouraging widespread coal development are made.

Mining and Reclamation

The actual processes of mining and reclamation are treated in a confusing and inconsistent manner throughout the EIS. On page I-59, the improbable assumption that grazing will be possible within five years of mining is coupled with the more sobering, though unsubstantiated, assumption that there will be a 50% loss in productivity for grazing purposes on mined land. On page I-80, it is stated that the objective of stripmine reclamation should be "to return the land to a realistically attainable land use." It is also stated that "a viable land use" is the goal. Page I-80. In view of the absence of any information at all to indicate that even limited success in reclamation can occur in the Powder River area, it is curious that the authors chose to state bold hypotheses rather than to emphasize caution.

Perhaps the greatest deficiency of the EIS relating to mining processes is the fact that the reader is left entirely uninformed as to what will be required of the mining companies. Just as one cannot assume reclamation is possible, one cannot expect that the companies will do any more than is required by law and/or lease stipulations. It is therefore extremely important to examine these requirements precisely, something the EIS fails to do. The timing of this EIS and the proposals contained therein is, of course, highly inappropriate with respect to the pending stripmine legislation in Congress. Interestingly enough, the authors do not even note that mining will, very probably, soon have to be carried out under a new set of rules. Such statements as the following raise a host of questions about the efficacy of present mining regulations, the intentions of the respective agencies, and the potential

effect of federal stripmine regulation:

"Because of thickness of coal and shallowness of overburden in some areas, several companies have proposed constructing lakes within their mine area. As in the highwall reduction method, all coal exposures would be covered with spoil. Highwalls are covered to control generation of acid water in the coal and to prevent spontaneous or accidental ignition of the coal beds. The companies will consult with officials of the Forest Service, the Bureau of Land Management, Wyoming Department of Environmental Quality, and with the U. S. Geological Survey to determine where further reclamation of the final cut or other mined areas is needed." Page I-85.

Indicative of the current inadequacies in stripmine policy is the hopelessly weak "protection" of surface owners offered by the authors of the EIS:

". . . BLM has further concerned itself with protecting interests of surface land owners when it proposes to issue new coal leases by consulting with the land owners when preparing stipulations for inclusion in the leases." Page I-14.

Here again pending Congressional legislation may have a substantial beneficial impact on the situation, which should at least have been mentioned by the authors of this EIS.

Socioeconomic Impacts

The treatment of socioeconomic effects of the 5 associated proposals tends to be very selective. As is typical of EIS's, the dollar benefits of increased employment are emphasized, to the exclusion or minimization of the many costs of development. In particular, the potential impacts on agriculture are poorly analyzed. The authors admit the inadequacy of their information concerning impacts on agriculture:

"The ranchers presently using this area will be impacted to an unknown extent." Page III-119.

Also, as previously discussed, losses in land productivity are expected, transfer of agricultural water rights to industry are

already occurring, and air quality degradation is unavoidable, with the proposed coal developments. But the EIS does not determine or discuss the importance (indeed, the impact) of these changes on the existing economy.

Remarkably, the problem of droughts and the history of the "dustbowl" days go unmentioned in this EIS. Some of the land proposed to be mined is part of the National Grassland system, put back into grass by the federal government in order to prevent a recurrence of the self-exacerbating dustbowl phenomenon. The assumption by the U. S. Forest Service that stripmining is an appropriate use of the Grasslands is not discussed in the EIS. The U. S. House of Representatives has included an explicit ban on stripmining in the National Grasslands in its version of the federal stripmine control legislation, clearly reflecting Congressional intention to prevent some of the proposals included in this EIS.

Conclusion

The tone of inevitability which pervades this EIS reflects the built-in and unquestioned pro-development bias of the federal agencies concerned. On page I-665 it is even assumed that conversion from agrarian to industrial economies is something which should and/or will happen generally. (One wonders if this transition is so cavalierly expected in all agricultural areas. The implications for world food supply are indeed startling.)

Given this bias, it is not surprising that alternatives to the proposed actions are not adequately analyzed. As indicated before, the authors demonstrate no understanding of the national coal picture. They further, and fatally, assume that the federal government is unable to direct and control the development of the public's resources. The lack of analysis of alternatives in this EIS makes it a disturbing companion to the ill-conceived national federal coal management program, as exemplified in the current draft EIS on coal leasing.

This closed-minded approach to alternatives may best be illustrated by the following key conclusion:

" . . . it seems reasonable to postulate that for some time to come the best alternative to the production of the coal from the Eastern Powder River Coal Basin of Wyoming would be to produce an equivalent amount of similar coal from elsewhere in Montana, Wyoming, or North Dakota." Page I-857.

Not only are the "alternatives" considered narrow to the point of being no alternatives at all, but also it hardly seems appropriate to base important policy decisions on "reasonable postulates" of alternatives which are best "for some time to come." On page I-11, it is indicated that the burden is on the ICC to make a positive determination of the need for the new railroad line. This, of course, would have to be based on an analogous determination that the coal from the proposed mines was needed. It is clear from this EIS, including the inadequacies of its analysis, that such positive information does not exist. Approval of the permits without substantially more proof would represent an abdication of government responsibility.

JULY 31, 1974

THIS IS MY STATEMENT IN REGARD TO THE ENVIRONMENTAL IMPACT STATEMENT ON THE POWDER RIVER BASIN, PLEASE ENTER IT INTO THE WRITTEN RECORD. MY NAME IS EILEEN DUNNEBECKE, AND I AM A CITIZEN AND A VOTER OF WYOMING.

TO BE SHORT AND TO THE POINT, I AM AGAINST ANY STRIP-MINING IN ANY AREA IN WYOMING. I HAVE NOT READ THE IMPACT STATEMENT, ITSELF, BUT HAVE READ A SUMMARY OF IT. IT SAID THROUGH MANY AREAS AND SECTIONS OF THIS STATEMENT THAT THE STRIP-MINING OF THE LAND OF THE POWDER RIVER BASIN WILL ADVERSELY AFFECT THE WILDLIFE, AIR, WATER AND THE LAND OF WYOMING. I LOVE WYOMING, AND I LOVE IT FOR IT'S ENVIRONMENT, WHICH GIVES LIFE TO THE PEOPLE OF WYOMING THROUGH IT'S VIRGINITY. IT IS THE PEOPLE OF WYOMING WHO WILL BE AFFECTED, AND I HAVE NOT FOUND MANY PEOPLE HERE IN THE STATE WHO ARE FOR STRIP-MINING IN THE POWDER RIVER BASIN.

STRIP-MINING, ITSELF, IS DESTRUCTIVE, AND TO MY POINT OF VIEW, UNNEEDED. NO LAND WITH THE TYPE OF SOIL AND CLIMATE AS ARE FOUND IN THE POWDER RIVER BASIN HAS EVER BEEN SUCCESSFULLY RECLAIMED. DR. MORTON MAY OF THE UNIVERSITY OF WYOMING HAS MADE A CLAIM OF DOING THIS, BUT THE EXPERIMENTS HE HAS DONE HAVE BEEN DONE UNSCIENTIFICALLY. DR. MAY HAS TAKEN A PLOT OF LAND, REMOVED THE TOP-SOIL, THEN REPLACED IT AFTER REMOVING THE VEGETATION AND RESEEDING THE LAND. NATURALLY HE GOT THE DESIRED RESULTS, THE LAND WAS NEVER STRIP-MINED, NOTHING WAS TAKEN OUT OF IT OR ANY MINERALS BROUGHT UP TO ALTER THE CHEMISTRY OF THE LAND. THE LAND CAN NEVER BE BROUGHT BACK TO THE WAY IT WAS, HOW IT WAS CREATED BY GOD. MILLIONS OF DOLLARS HAVE BEEN SPENT ON TEST PLOTS ALL OVER THE UNITED STATES, ^{for reclamation of strip mined lands,} BUT THIS TYPE OF EXPENSE WOULD PROVE UNFEASIBLE FOR THE AVERAGE CORPORATION OR FARMER OR RANCHER.

I SEE NO REASON FOR STRIP-MINING LAND WHEN ALTERNATIVE ENERGY SOURCES, LIKE SOLAR AND WIND POWER, ETC., HAVE ALREADY BEEN SEEN BY MANY EXPERTS (I.E. THE NATIONAL SCIENCE FOUNDATION COMMITTEE ON ENERGY) TO BE ABLE TO FURNISH, IF FURTHER DEVELOPED, A LOT OF POWER IN THE NEAR FUTURE. MANY SOURCES OF ENERGY ARE NOW BEING RESEARCHED AND TESTED, AND NOW, MORE IMPORTANT, PEOPLE ARE BECOMING AWARE OF WHERE THE MOVEMENT OF THEIR ELECTRIC TOOTHBRUSH ORIGINATES, AND HOW THEIR COMFORTS ARE MADE POSSIBLE. WE MUST BE MADE AWARE OF OUR OVER-CONSUMPTION AND IT'S EFFECTS, AND IF A SHORTAGE IS REQUIRED, LET IT BE. IT COULD BE MORE VALUABLE IN ALL FACETS OF OUR SOCIETY THAN MOST WOULD THINK. MOST PEOPLE COULD EXIST AND EVEN THRIVE ON HALF THE ENERGY THEY NORMALLY CONSUME. I BELIEVE WE WOULD EVEN HAVE A HAPPIER SOCIETY IF WE HAD LESS "COMFORTS".

DEEP MINING IS ANOTHER ALTERNATIVE TO STRIP-MINING. IT WOULD BE MORE CONCENTRATED ON THE LAND, WE COULD STAY IN ONE AREA. SAFETY HAZARDS NOW PRESENT IN DEEP-MINING COAL COULD BE AVOIDED BY AN UP-GRADING IN THE MINES THEMSELVES. AUSTRALIA AND ENGLAND DEEP-MINE THEIR COAL AND HAVE 3% OF THE DEATHS AND ACCIDENTS ^{in deep mining} THAT WE IN AMERICA HAVE.

STRIP MINING IN THE POWDER RIVER BASIN WOULD EFFECT THE ENVIRONMENT, NOT ONLY OF THE GILLETTE AREA, BUT ALSO THAT OF ALL OF WYOMING. THE WATER OF THE STATE WOULD BE DAMAGED, AS STATED IN THE IMPACT STATEMENT. SODIUM AND ALKALINE DEPOSITS BROUGHT UP THROUGH THE PROCESS OF STRIP MINING WOULD POLLUTE THE WATER, MAKING IT

UNDRINKABLE. THE LAND WOULD BE TORN AND SCARRED AND WASTED, AND PEOPLE FROM NEW YORK WOULD BE ABLE TO SHINE THEIR SHOES AND BRUSH THEIR TEETH WITHOUT ANY PHYSICAL ENERGY PUT FORTH BY THEMSELVES. THEY HAVE NO IDEA OF THE RELATIONSHIP THE PEOPLE OF WYOMING HAVE WITH THEIR LAND. THE LAND IS WYOMING, ALONG WITH THE WATER, THE PEOPLE AND THE ATMOSPHERE; AND WE MUST ALL LIVE TOGETHER.

I THANK THE PEOPLE WHO PUT TOGETHER THE IMPACT STATEMENT, AND WHO TOOK THE TIME TO MAKE IT SO GOOD. I HOPE IT WILL BRING THE REALITY OF THIS DESTRUCTION TO THE PEOPLE OF WYOMING AND ANYONE ELSE WHO CARES.

Ellen Dannelski

770 No 7th

Laramie, Wyoming 82070



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WYOMING
EXECUTIVE DEPARTMENT
CHEYENNE

STANLEY K. HATHAWAY
GOVERNOR

August 2, 1974

Mr. Dan Baker, State Director
Bureau of Land Management
U.S. Department of the Interior
2120 Capitol Avenue
Cheyenne, Wyoming 82001

Dear Dan:

I am pleased to enclose herewith the comments of the State of Wyoming on the Draft Environmental Impact Statement on Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming.

These comments and recommendations represent the divergent yet parallel views of the state agencies which comprise the membership of the Powder River Basin Task Force which I have appointed. As you may know I appointed this task force several months ago to help local government to resolve some of their problems with assistance from state government and industry. Our monthly meetings, I feel, have served as a means of communication between all of the various groups which comprise the membership of the Advisory Task Force which I also appointed. I am confident that this task force is aware of the challenge facing them and that they will be able to recommend specific proposals for the legislature, local government, industry and state government to implement.

I congratulate the E.I.S. team on the comprehensive work they have done to date on the statement and look forward to receiving your responses to the recommendations made by the State of Wyoming.

Sincerely,

A handwritten signature in dark ink, appearing to read "Stan Hathaway", written over the typed name.

Stan Hathaway

SH:vhc
Enclosure

VII-460

STATE OF WYOMING
COMMENTS ON
DRAFT ENVIRONMENTAL IMPACT STATEMENT
DEVELOPMENT OF COAL RESOURCES OF THE
EASTERN POWDER RIVER COAL BASIN
OF WYOMING

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The Draft Environmental Impact Statement is an overwhelming report. It will have taken 27 man years to complete by September, 1974, and yet people are requested to comment in a scant two months time on a project that will have an effect on the entire state for years to come.

The Draft Environmental Impact Statement is also another one of the many reports that is published that presents a negative point of view. All aspects are based on the possibility that things could occur and that all of these points are bad.

State Recommendation

The review period for a report of this magnitude is still too short and should be extended to at least September 1. A period of at least three months should be given for adequate comment and review. The lead agency continually publishes reports and many of a similar nature that must be reviewed in an unfair length of time.

Positive appraisal as well as negative appraisal, would provide reviewers the opportunity to view the situation as intended by NEPA. A multiple use concept should predominate and one sided approaches have no room in our present society. All facets of the economy and environment must work together for the good of all people to accomplish planned growth and development.

Comments

Department of Agriculture

In the paragraph on roads it is indicated that "an estimated 24 miles of new road will be constructed by 1990." Are these the prime all-weather access roads of 5 to 20 miles long, or are these roads that the companies plan to build?

State Recommendations:

What roads is the report talking about and how many miles of prime all-weather paved roads will be built; whether they will be state or county maintained and how many miles of improved gravel roads will be built. The road paragraph leaves much to be desired. These roads may also benefit agriculturists.

Comments

Department of Agriculture

In the paragraph discussing the "outlook for the agricultural industry," it is noted that "the outlook for the agricultural industry - - - is one of continuing deemphasis." Does this mean that agriculture in the Campbell-Converse County area will eventually dry up and blow away?

State Recommendation

Explain more fully what is meant by "continuing deemphasis." If it is farm labor, it is agreed that there will be a labor shift, but what else are your conclusions based upon.

Comments

Department of Agriculture

"Deep aquifers containing salty water not suitable for irrigation, or animal or human consumption are the proposed water sources." This implies that the State Statutes giving authority for the coal slurry line would have to use or contemplate using poor quality water.

State Recommendation

Under Title 41, Chapter 2, Article 1, Paragraph 41-10.5 Wyoming Statutes, 1974 Interim Supplement, the only requirements regarding water are (1) "That the water to be used is underground water from the Madison or Bell Sand formations;" (2) "that such use will not interfere with domestic, municipal, stock watering or irrigation uses or other existing beneficial uses within Wyoming;" (3) that the water is withdrawn from a source of supply located at a minimum of two thousand five hundred (2,500) feet below the ground surface, from wells constructed to a depth of more than two thousand five hundred (2,500) feet beneath the ground surface," etc. Nothing in the statutes restricts or implies that the water is to be unfit for human consumption. Parts of the statute should be so quoted so as not to mislead the reviewer.

Comments

Department of Agriculture

In the paragraph discussing water quantity it is stated that "Sources of water to meet these needs could be provided from available and unused ground and surface water or by transfer from present uses (irrigation, etc.)" Are the writers advocating the use of water right transfers and the use of unused shallow underground water?

State Recommendation

Water right transfers and the use of unused shallow underground water should be a last resort. If there are surplus waters or water from sewage treatment plants that is useable, then this should be used first. Industry can better afford the expensive deep underground water than can agriculture, and the transfer of water rights should only be a last resort as water taken from agricultural use creates economic problems in that sector.

Comments

Department of Agriculture

Under the heading Sandhills Grassland, Type 1 C, the same scientific name for Silver Sagebrush, and Big Sagebrush, i. e., Artemisia tridentata is used. This is not correct.

State Recommendation

The scientific name for Silver Sagebrush is Artemisia cana. All scientific names of plants should be cross checked with the "Standardized List of Weeds" published by the Weed Science Society of America. This aforementioned list is a commonly used list and should aid in correcting misspelled and inaccurate names.

Comments

Department of Agriculture

The paragraph on coyotes is not accurate since coyotes take a toll on a great many sheep and on the wildlife when domestic livestock are not available. A Draft Environmental Statement of February 8, 1972, U. S. Bureau of Sport Fisheries and Wildlife, USDI, indicated 80% of the predators taken by toxicants and 20% by trapping, denning, and shooting. As toxicants are not being used now, it would seem that four times as many would have to be taken by the methods (trapping, denning, and shooting) as were taken (pre-February, 1972). The information in this section should be substantiated or deleted.

Data prepared by the U. S. Bureau of Sport Fisheries and Wildlife refutes, rather than supports, that coyote population acts to "check" rodent population. Therefore, this statement in the E.I.S. should be substantiated or deleted. In addition, the U. S. Bureau of Sport Fisheries and Wildlife will not support the contention that coyote population fluctuates with rabbit and rodent population, therefore, we expect substantiation or deletion.

Density calculations should be included for all wildlife species. Dr. Dan Balser and Fred Knowlton, U. S. Bureau of Sport Fisheries and Wildlife, researchers, have data which should clarify these issues.

State Recommendation

Predator control is one of Wyoming Agriculture's biggest problems and is forcing many woolgrowers out of business. The paragraph would be better worded that "sheep numbers are declining due to predator problems. When domestic livestock are not present, coyotes will have an effect on the deer and antelope population."

Comments

Department of Agriculture

The statistics that have been put together are not as accurate as they should be. It is flattering to have all the land in one county considered "total land in ranches" however, "urban and built up areas" cannot be so considered.

State Recommendation

The 1970 Soil Conservation Service's "Wyoming Conservation Needs Inventory" shows the figure of 56,411 acres as "urban and built up" for Campbell County and 37,595 acres for Converse County. Also Campbell County cropland is about 144,824 acres and Converse County cropland is 132,840 acres. Woodland or forested area in Campbell County is 35,646 acres, while in Converse County it is 125,207 acres.

The 1971 Wyoming Water Planning Program Report Number 7, "Irrigated Lands Inventory for Wyoming" shows Campbell County having 5,231 irrigated acres and Converse County having 46,820 acres.

Comments

Department of Agriculture

January 1973 figures for cattle and calves are more accurate than the quoted figures. The heading "Sheep and Lambs" should be headed "Stock Sheep."

State Recommendations

	<u>CAMPBELL</u>	<u>CONVERSE</u>	<u>TOTAL</u>
Cattle and Calves	84,600	82,600	167,200
Stock Sheep	121,100	119,100	240,200

Comments

Wyoming Department of Agriculture

The cattle and calf numbers are not quite accurate and the initial source of all livestock statistical information is the Wyoming Cooperative Crop and Livestock Reporting Service.

State Recommendation

Campbell County dropped in cattle and calf numbers to 60,600 in 1962. Stock Sheep numbers have been declining, however, in 1964 Campbell County showed 176,000 head for a high and a low of 89,000 head in 1950, while Converse County showed a high of 135,900 head in 1958, and a low of 104,000 head in 1950.

These calculations should be considered in determining if sheep numbers are declining.

Comments

Department of Agriculture

The sentence beginning "Most of the hay is produced on irrigated meadows along the North Platte River - - -" is not accurate, since (a) the North Platte is not anywhere near Campbell County and (b) Campbell grows a good share of total hay production.

State Recommendation

1972 Wyoming Crop and Livestock Reporting Service Statistics show the following:

ALL HAY:	<u>ACRES HARVESTED</u>			<u>PRODUCTION (Tons)</u>		
	<u>Irrig.</u>	<u>Non.</u>	<u>Total</u>	<u>Irrig.</u>	<u>Non.</u>	<u>Total</u>
Campbell	2,800	40,400	43,200	7,000	40,800	47,800
Converse	32,000	3,900	35,900	65,200	3,300	68,500

ALFALFA HAY:	<u>ACRES HARVESTED</u>			<u>PRODUCTION (Tons)</u>		
	<u>Irrig.</u>	<u>Non.</u>	<u>Total</u>	<u>Irrig.</u>	<u>Non.</u>	<u>Total</u>
Campbell	2,000	12,500	14,500	5,900	18,100	24,000
Converse	19,700	400	20,100	51,200	500	51,700

Comments

Department of Agriculture

This table should be revised to show current statistics and correct mistakes. The source is the Wyoming Cooperative Crop and Livestock Reporting Service from whom Olson got his statistics.

State Recommendation

AVERAGE NON-IRRIGATED CROP
PRODUCTION 1950 - 1972
FOR CAMPBELL AND CONVERSE COUNTIES

	<u>CAMPBELL COUNTY</u>	<u>CONVERSE COUNTY</u>
<u>ALL WHEAT:</u>		
Average Acres Harvested Annually	24,380	4,072
Average Yield per Acre (Bushels)	19.9	16.0
Average Annual Total Production (Bushels)	484,200	65,191
<u>BARLEY:</u>		
Average Acres Harvested Annually	3,521	1,054
Average Yield per Acre (Bushels)	25.9	19.2
Average Annual Total Production (Bushels)	91,300	20,278
<u>OATS:</u>		
Average Acres Harvested Annually	5,293	1,143
Average Yield per Acre (Bushels)	23.9	20.7
Average Annual Total Production (Bushels)	126,317	23,626
<u>CORN FOR GRAIN:</u>		
Average Acres Harvested Annually	266	103
Average Yield per Acre (Bushels)	12.8	12.4
Average Annual Total Production (Bushels)	3,413	1,280
<u>ALL HAY:</u>		
Average Acres Harvested Annually	40,821	6,064
Average Yield per Acre (Tons)	0.82	0.75
Average Annual Total Production (Tons)	33,564	4,525

All crops, except hay, are 1950 - 1972. Hay is 1959 - 1972.

Comments

Department of Agriculture

This table should be revised to show current statistics and correct mistakes. The source is the Wyoming Cooperative Crop and Livestock Reporting Service from whom Olson got his statistics.

State Recommendation

AVERAGE IRRIGATED CROP PRODUCTION
1950 - 1972
FOR CAMPBELL AND CONVERSE COUNTIES

	<u>CAMPBELL COUNTY</u>	<u>CONVERSE COUNTY</u>
<u>ALL WHEAT:</u>		
Average Acres Harvested Annually		382
Average Yield per Acre (Bushels)	Negligible	22.7
Average Annual Total Production (Bushels)		8,661
<u>BARLEY:</u>		
Average Acres Harvested Annually		1,502
Average Yield per Acre (Bushels)	Negligible	38.2
Average Annual Total Production (Bushels)		57,396
<u>OATS:</u>		
Average Acres Harvested Annually		1,685
Average Yield per Acre (Bushels)	Negligible	20.7
Average Annual Total Production (Bushels)		70,726
<u>CORN FOR GRAIN:</u>		
Average Acres Harvested Annually		226
Average Yield per Acre (Bushels)	Negligible	40.5
Average Annual Total Production (Bushels)		9,161
<u>BEANS:</u>		
Average Acres Harvested Annually	—	484
Average Yield per Acre (Cwt)	—	13.4
Average Annual Total Production (Cwt)	—	6,479
<u>SUGAR BEETS:</u>		
Average Acres Harvested Annually	—	492
Average Yield per Acre (Tons)	—	11.7
Average Annual Total Production (Tons)	—	5,777
<u>ALL HAY:</u>		
Average Acres Harvested Annually	1,496	28,700
Average Yield per Acre (Tons)	2.16	1.73
Average Annual Total Production (Tons)	3,239	49,529

All crops, except hay, are 1950 - 1972. Hay is 1959 - 1972.

Comments

Department of Agriculture

The term "an average" is not absolutely correct since there are no concrete figures for the exact amount of irrigated land from year to year.

State Recommendation

Change the paragraph to read "The 1971 report of the Wyoming Water Planning Program entitled, "Irrigated Lands Inventory for Wyoming" indicates that there is 5,231 irrigated acres in Campbell County and 144,824 acres devoted to cropland. Total cropland represents 4.8 percent of the county land area of 3,043,200 acres. The major dry-land crops have been hay, with a past average annual yield of 33,564 tons from 40,821 acres; and wheat which has been harvested on approximately 24,380 acres yielding 484,200 bushels. Acreages of oats, barley and corn are also harvested."

Comments

Department of Agriculture

Since there are new statistics available for crop acreages, change the paragraph; and there are other irrigated lands which are not necessarily near the North Platte.

State Recommendation

Change the paragraph to read "In Converse County, irrigated lands amount to 46,820 acres or 1.7 percent of the county land area. Hay is the principal crop raised under irrigation and in the past has yielded approximately 49,529 tons per year from 28,700 acres. However, a greater variety of crops can be grown in Converse County than in Campbell County due to water availability. Acres of barley, oats, corn, beans, and sugar beets are harvested annually as cash crops or livestock feed."

Comments

Department of Agriculture

As noted in Volume I, Page I 48, what are the various road types?
Are they prime, gravel, dirt, etc.?

State Recommendation

What types of roads are meant? Also mention miles of each and
location.

Comments

Department of Agriculture

Why does it appear "that Green River water will be the only water imported?"

State Recommendation

State why Platte River, Yellowstone River, Yellowtail Reservoir, or Big Horn River water won't be used, instead of Green River water. This comment has been mentioned several times and other water importation projects are never mentioned. Only Green River water. The Bureau of Reclamation has done an aqueduct study for the study area and the Green River was an alternative as were the other rivers.

Comments

Department of Agriculture

The story is not that "coal development could impact present water rights and unappropriated water amounts" but that it will have a decided impact. Companies who purchase the land for the water are doing a disservice to agriculture.

State Recommendation

Companies who wish to purchase water rights should be urged to find unappropriated water, and it may be necessary for the state to mandate that agricultural water must stay with the land. The state should also urge the companies to lease back to the landowner the land and water until such time as it is needed or for the companies to farm the land themselves.

Comments

Department of Agriculture

"The major component which will be missing in the reestablished community will be sagebrush." Who says this is a major component? Why must it be reestablished? Percentage of cover, by species, of the present lands is needed.

State Recommendation

For years sagebrush spraying has been advocated, since removing the brush aids in moisture accumulation, snowpack accumulation, and in growth of hardy grasses. Sagebrush will reestablish fast enough without our replanting it or missing it on a few thousand acres. What sagebrush that remains will be more than adequate for wildlife.

Comments

Department of Agriculture

The second sentence "A well supervised coal digging system could uncover valuable scientific data - - -" is correct, however, is it implied that the coal digging won't be well supervised?

State Recommendation

Now is the time for the State and those interested in archaeological and paleontological values to work with these companies. Be positive, there's no way of knowing what's down there until digging begins, so dig, and if some university types are around looking for treasures, so much the better. Companies will probably be more than pleased to lend a hand if the site appears to have a value. But don't go overboard and grab every bone that comes about, the site must be worthwhile.

Comments

Department of Agriculture

"Collision hazards . . . are certain to increase." A statement of fact is made without any statistics to back it up. The implication is "quite a number" but are there facts or figures to back this up?

State Recommendation

Definite implications are made, aimed at the feelings of specific groups of people and there are no facts to back up the statements that collisions will increase. Increase from what base? Without facts the statement is meaningless.

Comments

Department of Agriculture

The statement "Such disturbances can lead in time to increases in coyote predation on livestock and game species favored by man" is a misstatement. Coyotes are already preying on livestock and wildlife. In some Southern states coyotes are invading the cities and becoming aggressive. It is noted that the black footed ferret can be adversely affected by losses of prairie dog colonies. Does the black footed ferret presently exist in the area?

Previously it was stated that coyote (and other predator) population fluctuates with prey species. Now a reduction in prey results in a coyote build up. Which hypothesis can be substantiated? A copy of that substantiation is requested. Dr. Balser and Fred Knowlton, U.S. Bureau of Sport Fisheries and Wildlife Researchers, should be asked to provide data.

State Recommendation

Adequate predator control has been advocated for sometime and now it appears that predator control for people's sake will be necessary. Finally people will understand that there is a coyote problem.

In Volume I it is stated there have been three sightings of the black footed ferret. Have these sightings actually been verified, and is it that important to be concerned with a predator who is nearly, or is extinct, and whom few people would know if they did see it? Is it possible that ferrets may not exist in the area that there may not be anything to save?

Predator-prey dynamics require substantiation.

Comments

Department of Agriculture

The statement, "Much of this water maintains a fish and wildlife habitat base on irrigated meadows, . . . " is a little fanciful. There is fishing in the Powder River Basin, but fishing in the ditches and dry streams seems a little far fetched. It is noted that the figure of 1.5 million acre feet has increased 1/2 million acre feet in 27 pages. The density of wildlife on meadows is necessary to substantiate the claims made.

State Recommendation

Fishing can be done on the reservoirs and where the streams are live, but to make it sound as if fishing abounds all over the irrigated areas is a bit untrue.

It should be stated whether the figure 1 million or 1.5 million acre feet is the correct amount filed with the State Engineer for change in use.

Comments

Department of Agriculture

The figures in this paragraph are misleading and the facts should be restated.

State Recommendation

Restate the paragraph thusly: "The total area of Campbell and Converse Counties is approximately 5.7 million acres of which 700,000 acres is federal land and 460,000 acres is state land. Most of the federal and state land is in scattered tracts, however, the national grasslands with 31,600 recreation visitor days in 1973 (344,000 acres) is the largest area of fairly well blocked federal land, with the remaining federal land (385,000) scattered as small isolated tracts."

As can be seen some of the figures have been readjusted to current figures.

Comments

Department of Agriculture

In the fourth sentence the figure 1.5 million acre feet is mentioned as the amount of water that has been requested to be changed from agricultural to industrial uses. Is this the correct figure?

State Recommendation

Either the 1.5 million acre feet is wrong or the 1 million acre feet is wrong on page 501, paragraph 4, Volume II, Chapter V. These two figures should agree.

Comments

Department of Agriculture

It is stated that the sand, gravel, and clinker material may be mined from stream courses and this will impact scenic recreation lands. Are these stream beds and limestone outcrops really as scenic as you would have people believe? "Scenic" is nebulous unless quantified. What scale is being used?

State Recommendation

It does not seem quite accurate that sightseeing in some of these remote areas is as important as people might believe. Much of this country is private and therefore, little sightseeing occurs, and since many of these streams are intermittent, it does not seem as though the recreation impact would be very great.

Refer to Vol. II, Chapter V, page I 537, Paragraph 2. A recreation use of 10.87 acres per visitor day is not heavy use compared to Yellowstone and other areas.

Comments

Department of Agriculture

It is stated that "0.6 percent of agricultural land will be disturbed and lost to production by 1990," but it is not stated what is produced on this land. It is then stated that "the permanent loss is not a significant regional loss - - -." On what basis are these facts stated?

State Recommendation

What is the production on these lands and what is grown there? The second statement appears to be a biased judgement and would appear to be the writer's ideas rather than fact.

Comments

Department of Agriculture

In sentence 6 and 7 it is stated that molestation of grazing animals is expected to increase. Are there any facts and figures to back up the statement? If it is happening now, what is the occurrence?

State Recommendation

If in fact the statement is true, there should be facts to back it up. Also, if grazing animals are molested, won't wildlife have a problem also?

Comments

Department of Agriculture

In the statement, "Construction of railroads, highways, and service roads - - -" it is agreed that there would be some management problems; but how many miles of roads are anticipated?

State Recommendation

At one point it is mentioned 25 miles of roads, now there are other roads. State the total mileage of all types of roads.

Comments

Department of Agriculture

Loss of livestock watering facilities and the high cost of replacement wells is discussed. Isn't it probable that the coal companies will have made arrangements with the various ranchers to help alleviate this situation prior to beginning operations?

State Recommendation

The coal companies will want to get along with the rancher and it should be part of the agreement if it isn't already, that if facilities dry up, then the companies will replace them.

Volume II, Chapter V page I 546 Paragraph 2
Volume II, Chapter V page I 546 Paragraph 3

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Comments

Department of Agriculture

Various impacts are anticipated regarding loss of irrigated crop-land, however, if mapping or surveying were done in this area, would these facts hold up?

State Recommendation

Irrigated agriculture may be disrupted; but using statistics to prove a point with some question of reliability is incorrect. A flight or ground survey could prove your statistics and logics are wrong.

Comments

Department of Agriculture

In the fourth sentence it is stated that "Irrigation water is the major supply available to industry - - ." Major implies that it is in the greatest abundance, however, isn't it possible that deep underground water and surplus surface waters are in even greater abundance?

State Recommendation

Industry should be encouraged to explore for deep underground water and to use surplus surface waters before agricultural purchases are contemplated.

Comments

Department of Agriculture

Under the heading "Summary" it is stated "the direct loss of agricultural land and production by 1990 would not constitute an important regional impact as lost production by that time is anticipated to represent one percent or less of the total regional agricultural production." On whose authority will this production not be important? What is meant by "not constitute an important regional impact?" Please identify the "region."

State Recommendation

State how the conclusions are made, especially after an agricultural survey of the area is taken. What is the region? If it is two counties or the 7 county area or the 3 states, it may be important. What agricultural production is presently going on near the mining area?

Comments

Department of Agriculture

On whose standpoint is a 6 percent loss of irrigation water not considered a significant impact? The study area is not a large area and it appears that again statements are made without facts. A 6 percent loss is significant. Assume 6 percent of the nation's energy may be developed in the Basin, is that 6 percent significant?

State Recommendation

Leave irrigation water alone and develop deep underground and surplus waters. It sounds as if the comment is: "It all depends on whose ox is gored." The statements leave much to be desired, since they are brash statements with little or no idea of the real agricultural impact in the area.

Comments

Department of Agriculture

In the eighth sentence, it is stated that the State Highway Department feels that "substantial improvement and up-grading of State Highway 59 - - will be required." Isn't it true that in the past 10 years this road has had tremendous traffic increases and that with increasing traffic, the whole road should be replaced?

State Recommendation

The road has been dangerous for many years due to hills and valleys and being narrow. The road should be widened for its entire length and it should have passing lanes, etc. "Substantial improvement and up-grading" are poor terms, the whole route should be replaced.

Comments

Department of Agriculture

Under the heading "Conclusion," it is stated that "the arriving population probably cannot afford new housing." It is agreed that the housing supply portion of the statement in light of other expanding developments in the Southwestern part of Wyoming is true. However, couldn't the companies build company towns in a central location and lease these houses back to their employees? Are these employees to be underpaid as compared to average wages?

State Recommendation

It would appear that this is a company problem rather than of state nature. We agree, the State doesn't want slums but it would seem that the companies would be interested in their employees' well being.

Comments

Department of Agriculture

The statement is true as long as irrigation water is the only water used. "Adverse, unavoidable impact" are pretty strong terms and the whole process could be partly avoided if surplus surface waters and deep underground waters were used.

State Recommendation

Urge and encourage companies to build reservoirs to store surplus surface waters and drill deep underground wells to lessen the impact on agriculture.

Comments

Department of Agriculture

Are there facts and figures to back up this figure of irrigated cropland loss of 31,473 acres? Are the acres that are going to be mined presently irrigated? Is it not possible for agriculture and industry to share some of the water?

State Recommendation

Without adequate surveys of the areas now, there are no ideas of what is now being produced or what will be lost. An adequate land survey of the several mine areas is necessary.

Comments

Department of Agriculture

This statement sounds like two year olds fighting. "Rehabilitation of lands solely for grazing purposes would impact and limit other land uses" is a ridiculous statement, since it fails to make the comment that primarily what is out there is grazing land, private land not seen by the sightseer, hunted over by the sportsman, and grazing land certainly adds to the aesthetics, to the economy, and to wildlife. Is there proof that this rehabilitation will "impact and limit other land uses?"

State Recommendation

For years agriculture has worked under the multiple use concept and now it's only grazing. Agriculture never fenced to keep wildlife out and generally if the sportsman asks permission of the landowner he can cross and use the land. The concern is good rehabilitation for all uses, not for single uses but multiple uses. Secondly, it may or may not be company land and that may also dictate what the rehabilitation will be, however, no one has ever argued over good grass.

Comments

Department of Agriculture

The statement "Sagebrush seeding would be highly desirable along with other plant varieties," is a falsehood. Why plant sagebrush once rid of it? As a matter of fact, it will grow back without seeding help, and if it's being done for antelope, take a look at where they graze now. All the sagebrush for a 20 square mile area won't be removed, so there will be plenty for the wildlife. Plant species by percentage, must be identified on lands under present use.

State Recommendation

Do not reseed sagebrush, once rid of it. Better soil moisture and better multiple use of the area by all concerned will be found. Use the University of Wyoming Weed Specialist's opinions and thoughts before this little trick is done.

Comments

Department of Agriculture

Why design "Water impoundments - - specifically for wildlife habitat?"
Are wildlife the sole users of the land now? Refer to inconsistent statement on Page I 688, Paragraph 1, Volume II, Chapter VIII, i.e., single-use assumptions.

State Recommendation

Narrow, one-sided, tunnel vision people have no place in this study. The multiple use concept is the only concept that should be used and designing things specifically for one section is narrow-minded. Secondly, wildlife aren't the only users of the areas now.

Comments

Department of Agriculture

Why would "Water impounded for recreation use be unavailable to industry, agriculture, and other uses?" Refer to previous "single use" concept comments.

State Recommendation

Multiple use is the concept, not dominant use of one outfit over another.

Comments

Department of Agriculture

Under the heading "Impacts" it is stated that " . . . average yields uneconomical unless irrigation is available . . Recreation use would be eliminated . . . Livestock grazing would be limited to specific seasons . . Economic and local demand for farm products would bear directly on this alternative." Why would all these occur if the areas were returned to cropland? Reasons for making these assumptions should be clearly stated.

State Recommendation

The multiple use concept should prevail; however, some rehabilitated areas will be returned to their present uses, probably grazing and this can be productive. In other areas, cropland can be a new use for this area where there was little or nothing. Multiple use and coordination should prevail, not tunnel vision.

Comments

Department of Agriculture

In the 3rd sentence it is stated that "Long term productivity of this land will be lowered by 50 percent, or 2,600 animal unit months per year." Why, and who says so?

State Recommendation

Under whose thoughts is the figure 50 percent used? It appears that this is a number pulled out of a hat. Couldn't the figure be 10 or 25 percent? This statement needs some authoritative facts and figures.

Comments

Department of Agriculture

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The second sentence, "If water is to be imported, it most likely will come from the Green River in Southwestern Wyoming," is pure fantasy. Why the Green River? Why not the Yellowstone, Big Horn, or Platte Rivers?

State Recommendation

There are many alternative sources of water, yet in both volumes importation of Green River water is discussed. Why? State the other alternatives as mentioned by the Bureau of Reclamation in their aqueduct study. Adequate alternative comparisons are necessary and none are given.

Comments

Department of Agriculture

The statement "By 1990, an estimated total of 9,500 acres will have been irreversibly and irretrievably committed to uses other than presently exist on the land," needs explanation, as do the other two sentences "This change will mean a permanent loss of wildlife habitat and grazing land. Displacement of all animal species from this land will occur," is another tunnel vision statement. What is planned for these 9,500 acres, have one big hole, a lake, or what? How come there will be no animal species at all on this 9,500 acres? Who says so? Substantiation is needed.

State Recommendation

"All" is a mighty big word and could be used if the 9,500 acres was a lake or a big void hole, but to have no animal species sounds wrong. The animals will come back and in some cases before rehabilitation occurs as evidenced at the Exxon mine. Who is the authority for such a statement?

"Irreversibly and irretrievably" also seem misplaced, since this sounds as if the 9,500 acres will be a big void. First, won't this acreage be spread around at many of these mines? Is it correct that this acreage is the sum total and if the last hole per mine is a lake, won't this be better than rangeland? To be irreversible and irretrievable the land if rehabilitated must be on it's end, straight up and down, or upside down. Rewording the paragraph might help.

Comments

State Conservation Commission

The proposed guidelines for reclamation scheduling to restore to livestock grazing use indicates a minimum of two years to re-vegetate the spoil and mined areas. Erosion of these areas as well as controlling weeds could become a very serious problem. ,

State Recommendation

Use one of the two following alternatives:

1. Seed grass and mulch with two (2) tons of prairie grass, hay or straw after spreading the top soil, or
2. Seed sorghum or other adequate cereal grain after the top soil is spread. Seed grass and other adapted species desired into the sorghum or other grain stubble in late fall of the same year or the following spring. The stubble will help provide added moisture from winter snows and reduce erosion.

Comments

State Conservation Commission

It is stated there will be a 50% loss in productivity for grazing purposes even if the entire area is re-vegetated.

State Recommendation

Identify the supporting data for the use of 50%. It is impossible to evaluate the effects upon development and grazing use after reclamation without presenting the basis for deciding a 50% loss in productivity.

Comments

State Conservation Commission

Based on the assumption that the best technology will be applied, an estimated 70 to 80 percent of the mined land surface would be expected to be successfully rehabilitated under existing climatic and soil conditions. Why only 70-80% of the mined lands may be successfully rehabilitated?

State Recommendation

Is this figure conducive to the area in question? Identify the basis for using this percentage.

Comments

State Conservation Commission

Statements declaring that rehabilitation techniques to include the re-establishment of vegetation have not been successful to reach a near climax are misleading and incorrect. To date, there are over eleven (11) test plots and reclaimed areas within Wyoming which have shown successful results in techniques of reclamation. When properly applied, reclaimed lands can produce a near climax vegetative condition and also surpass present climax conditions in vegetative types.

State Recommendation

These paragraphs should be supplemented with statements reporting the results and efforts already attempted to reclaim strip mined lands.

Comments

State Conservation Commission

Throughout these paragraphs, the term "topsoil" is used in reference to salvage, stockpiling and replacement.

State Recommendation

Topsoil is generally defined by qualified soil scientists as the upper layer of soil materials which can support plant growth. Soil materials might be preferable in some instances as soil materials from below the top soil strata may provide a better growing medium.

Comments

State Conservation Commission

The compiled Soil Association Map of the Powder River Basin prepared by the U.S.D.A. Soil Conservation Service using existing information dating back to 1953 and yet interpreted according to modern classification concepts. The last sentence points out that this identifies an element of questionable accuracy in the basic soil association map. Yet, the U.S.D.A. Soil Conservation Service which is the primary federal agency to make soil surveys has since prepared a much better map and current data about soil composition in map units.

State Recommendation

The current inventory and information on soils and groupings for the subject area is available from the U.S.D.A. Soil Conservation Service and should be considered for the prior revision and/or final environmental impact statement instead of using old survey information presented in the draft Environmental Impact Statement.

Comments

State Conservation Commission

Throughout these pages and in discussing vegetation on each site analysis, big sagebrush is emphasized as the predominate vegetative species. For instance, paragraph 3, page I 273, big sagebrush/grass vegetation type is by far the most wide-spread shrub community in the area, yet the last sentence states that the big sagebrush type occupies 4,188,000 acres. It appears vegetative types and sub-types are misnumbered and confusing. Big sagebrush is not the dominate vegetative species as it will make up less than 20% of the species composition with grass specie at 60% and forbs and other plants the remaining 10%. The density of any specie can vary on a specific area within these 4,188,000 acres, depending upon soils, grazing use, fires and so forth.

State Recommendation

Vegetative analysis statements and terminology should be consistent and reflect the inventory and use of vegetative resources in the environment, giving due weight to vegetative resources analyzed. Total impact of development cannot be adequately evaluated with misleading information.

Comments

State Conservation Commission

The statement on Plains pricklypear on its abundance and distribution is very misleading. The abundance and distribution of this species is related more to over grazing than drought. It may be found in denser stands on good rangelands but has increased during over grazed periods. Drought years can accelerate this process.

State Recommendation

Make appropriate corrections to prevent misleading information.

Comments

State Conservation Commission

The figures used in this paragraph showing the U.S. Forest Service lands (Thunder Basin Grasslands) and the Map 1 Appendix A appear to be in conflict as the Map 1 legend shows the Forest Service (light green) having control of the private lands within the boundary of the Thunder Basin National Grasslands.

State Recommendation

Re-examine the ownership pattern of Map 1 and make corrections.

Comments

State Conservation Commission

The statement of overburden removal will result in complete destruction of soil horizons, parent material and soil characteristics and result in bringing to the surface, elements such as boron which may be toxic to plant growth is correct but incomplete.

State Recommendations

This statement should include the fact that no toxic concentrations have been found to date in mining or core drilling that has been completed.

Comments

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State Conservation Commission

Irrigation waters have already been acquired for industrial uses and the projected loss of irrigation water to industrial use would result in an estimated additional loss of 31,500 acres of irrigated cropland. This would include a loss of these waters for recreation, wildlife and other multiple uses.

State Recommendation

To allow for the permanent loss of water for agriculture may be detrimental for the State of Wyoming. Industrial firms should seek the acquisition of water only for the life of the operation with commitments to return the water rights to agricultural use after termination of the industrial operation.

The statement is not really a regional analysis. Several areas where development will be very important to the Powder River Basin are excluded from the statement, namely Johnson County and Southern Montana. Although broader in scope than traditional site-by-site impact statements, by ignoring these areas the statement cannot be considered a truly regional analysis.

Several very difficult problems of economic analysis are not addressed adequately. The uncertainty of the eventual spatial pattern of settlement is assumed away. The extreme demands that rapid growth will place on labor supply is not treated adequately. The difficulty of predicting the precise age characteristics of the immigrants, and thereby the demands they will place on service delivery systems is not addressed. The discussion of culture and lifestyle is filled with generalities and undefined terms, and is not very enlightening. Assuming that policy objectives in this area would center around preserving desirable aspects of present lifestyles and minimizing conflict between new and old residents, much more must be done in this area than has been done here.

CommentsDepartment of Economic Planning and Development

This draft statement seems to infer that state and local governments cannot adequately respond to impact development in the Powder River Basin. The sections on land use controls and constraints fail to give a clear picture of the authority relationship between state, county and city government. The role of Federal government in land use planning is emphasized to the point of redundancy.

State Recommendation

We would suggest changing the tone of the report from a negative input to a positive input by state and local government. All levels of government must work in harmony to accomplish the difficult tasks associated with impact growth and development.

There seems to be a disparity of figures scattered throughout the Draft Environmental Impact Statement which misleads the reader. For example, on page I 459 it is stated that "12 new coal mines, 4 power plants and 2 gasification plants will be on line by 1990." Then on page I 514, a statement reads that 11 new coal mines, 2 power plants and 2 gasification plants will be located in the Powder River Basin by 1990." It leaves one with the feeling that the authors don't really know what development is going to occur.

State Recommendation

It is realized that the EIS Team was under considerable time constraints to finish this statement which could occur for discrepancies in facts and figures stated in the report. However, a quality Environment Impact Statement should present a clear picture of what development is definitely going to occur, what development is probable and may occur and what are the resulting implications associated with the development of the mineral resources.

The effects of impact coal development on population growth, new jobs, additional housing, increased educational needs, and increased demand for health and social services, fire protection, water; sewer and various utilities has been discussed throughout the regional analysis of the draft environmental impact statement.

The prime question that comes to mind in analyzing these factors is are there some beneficial effects of the impact development that would counter balance the negative aspects identified in the report. For example, in discussing increased employment a typical statement is "the unavoidable effect that large quantities of employment opportunities will be created, is largely a consequence of the decision to allow development."

What about the positive economic gains to a community associated with new jobs for local residents as well as Wyoming residents at large? A trade off between economic gains vs. economic hardships placed on a community should be addressed to gain a broader viewpoint of impact development. A one-sided approach being either positive or negative doesn't connote a realistic analysis of existing and potential socio-economic conditions. Increased tax revenues for local government from coal development for example, could be mentioned as a positive result of mineral development.

State Recommendation

Positive benefits attributable to economic growth and development should be included in the socio-economic sections as well as other portions of the Environmental Input Statement.

The section on housing in Volume II is generally a presentation of the obvious. It seems necessary to review housing conditions in 1974 to gain knowledge of the current market conditions.

The importance of mobile homes is under emphasized. The writer is apparently not in favor of them as a housing alternative.

Comments

Department of Economic Planning and Development

This Environmental Impact Statement is written in a very negative manner. Any possible undesirable aspect of the proposed development of the Powder River Basin coal is highly emphasized while positive or desirable aspects are mentioned in passing, played down or omitted. The Environmental Impact Statement appears to have been prepared on the theory that when in doubt assume that the worst possible result will occur.

The Environmental Impact Statement is very repetitious and could be condensed.

Many statements, figures and conclusions are contained in the Environmental Impact Statement that need to be documented in the text as to specific source of information.

It is difficult to determine if the Environmental Impact Statement is really dealing with the four specific actions as stated or if it is attempting to deal with the total potential development of the region.

In reading the Environmental Impact Statement the feeling prevails that many of the authors were totally unfamiliar with the region and had made little effort to substantiate some of the statements.

Comments

Department of Economic Planning and Development

In the paragraph on roads it is indicated that "prime all weather roads 5 to 20 miles long will connect mine sites with major state routes." Also haul roads in the vicinity of mine sites are mentioned in this paragraph. At the end of the paragraph it is stated that "an estimated 24 miles of new road will be constructed by 1990." Does this imply that only 24 miles of road construction will occur due to mineral development?

State Recommendation

The total anticipated miles of all weather access roads and total miles of haul roads should be identified as they will have a definite impact on the environment and land use of the area.

Comments

Department of Economic Planning and Development

The source of water for the proposed Carter Oil Company Gasification Plant is noted as not being identified. Press releases have indicated that the proposed Hole in the Wall Reservoir would be the source of industrial water for Carter Oil Company projects. The transfer of water from the Kaycee area to the Gillette area requires a right of way, etc. and therefore will disturb additional acreage in the Powder River Basin.

State Recommendation

Identify the proposed water source of Carter Oil Company and its effects on the environment. It is impossible to evaluate the total impact of development without adequately presenting all the facts.

Comments

Department of Economic Planning and Development

Under Wyoming statutes, counties are delegated the authority to develop and implement a wide spectrum of controls and regulations provided they are not specifically reserved to the state. A further breakdown of regulatory powers between counties and cities and towns is provided by statute. Counties have jurisdiction over unincorporated territory, and cities and towns have jurisdiction over incorporated area.

The statement reading "Wyoming law defines unincorporated territory to include lands over one mile from the limits of a town or city having a population of one thousand or less, two miles from a town or city having a population between two thousand and three thousand, and three miles from the limits of a town or city have a population of over three thousand" applies to certain kinds of jurisdiction.

A recent Supreme Court opinion (Franklin Carter, et al v. The Board of County Commissioners of the County of Laramie, State of Wyoming, Jan. 1974) implies that the one, two and three mile jurisdictional clause applies only to sanitary facilities and not to comprehensive planning and zoning jurisdiction. Thus the counties would have regulatory powers in this disputed area for comprehensive planning and zoning and not the cities. The authority under Chapter 6.1, Title 18 (28-289.1 -- 18.289.9) WS 1955, as amended, is in direct conflict with 18-289.1 -- 18.289.9 as amended in 1967.

State Recommendation

It is recommended that the above lines be stricken from the statement or clarified in writing so as not to mislead the reader.

Comments

Department of Economic Planning and Development

The entire third paragraph dealing with the status on county planning is in error. Some general comments on the inaccuracies are outlined below.

For the eight-county regional area, it is noted that only Natrona County and Campbell County have developed and adopted comprehensive plans. Johnson County has been working on the development of a comprehensive plan for the past two years. Only Natrona County has passed a zoning ordinance for a portion of the county. However Natrona, Johnson, Campbell and Sheridan counties have passed or are working on subdivision regulations, mobile home park codes and other land use control measures. Campbell, Natrona, and Johnson counties have active joint city/county comprehensive planning programs with resident planners and staffs on board. Glenrock, Douglas and Converse County have acknowledged their potential for a joint city/county planning office.

Much remains to be done in the area of planning for growth in the Powder River Basin. However, within the past two years, five of the eight counties have initiated planning activities of various degrees to meet impact development.

Volume I, Chapter IV pages I 405-417

Comments

Department of Economic Planning and Development

The housing characteristics presented have very little significance if not analyzed and compared with the U.S.

State Recommendation

The analysis should concentrate on the financial elements which are likely to be and have been severe problems for the study residents.

Comments

Department of Economic Planning and Development

Reference is made to a new 500 megawatt water-cooled power plant by 1985 and another 500 megawatt water-cooled power plant by 1990 in the paragraph on projected development of the year 1990. There is no previous acknowledgement of these projects nor are they identified as to location, ownership, etc.

State Recommendation

It is recommended that all the proposed power plants, gasification plants, and coal mines be identified by company, location, etc.

Volume II, Chapter V page I 572 Paragraph 1

Comments

Department of Economic Planning and Development

"The other four counties will experience a decreased housing demand relative to 1970 levels." This statement is probably not true since the City of Sheridan issued 20 single family building permits in 1972.

Volume II, Chapter V page I 572 Paragraph 4

Comments

Department of Economic Planning and Development

"...while the other four counties will need no additional new housing other than that existing in 1970." Earlier in the report the point was made that a substantial portion of the housing was built before 1930. It would seem that some of those houses would need to be replaced.

Volume II, Chapter V page I 573 Paragraph

Comments

Department of Economic Planning and Development

Using 1972 construction cost data is questionable in 1974 because of rapidly rising prices.

Comments

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Department of Economic Planning and Development

This section of In Phase and Staged with Socio-Economic Development proposes that the federal government should consider creating a federal land use planning program designed to direct and control the growth of cities and towns in the Powder River Basin. It implies that existing federal planning systems of the BLM and U.S.F.S. could be used to implement land use planning on federal lands and thereby guarantee that coal development will occur on a predetermined basis and revenues required for public facilities would be available in a timely sequence. It is interesting to note that private industry, local, and state and federal governments and individual citizens have been grappling for the past few years with the difficult question of how to accommodate the social and economic needs and demands placed upon communities as a result of impact growth and development. No overall concrete solution has emerged, as yet.

To suggest that federal land use planning is the answer to this complex is commendable, but it is doubtful based on the past history of the federal government, that an amiable solution could be reached. Coal development on private and state lands will occur regardless of the eventual federal decision on coal leasing. Therefore, the impact of growth and development cannot be controlled by restricting coal development just federal lands. In addition, a divergent land use policy based on ownership would create a chaotic and unmanagable utilization of the land resources.

State Recommendation

It is recommended that this section be deleted or changed to reflect a more realistic approach in dealing with impact growth problems. Coordination and cooperation between private industry, community leaders, and all levels of government is the only possible means of achieving some resemblance of orderly growth.

Lack of communication between the public and private sector was listed as one of the major causes of impact growth problems that occurred in southwestern Wyoming in the last few years. It is unrealistic to assume that orderly growth and development will occur with 100% degree of success by any methodology or course of action.

Local control should be emphasized and improved with state and federal assistance wherever possible and feasible. Federal programs that would generate economic aid to impacted communities would play a more beneficial role in orderly development rather than through Federal land use controls and regulating efforts. Regulatory requirements should be maximized at the local and state level of government.

Comments

Department of Economic Planning and Development

The discussion of mental health and alcoholism is very unclear. "Thus although Campbell County's mental health problem are substantially the same as in other areas of the region, the underlying causes are more readily identified." What does this statement mean? If two sets of circumstances ("boom" conditions in Campbell County versus "nonboom" conditions elsewhere produce identical results (i.e. mental health problems that are substantially similar), how can causation be assigned. Later, we are told that "(a)s a relatively stable ranching area, the caseload in Converse County reflects the general composition of mental health problems throughout the Powder River Basin region." Since Casper is in the Basin, are we to conclude that mental health problems do not vary between boom and non-boom nor do they vary between rural and urban places (Natrona versus Niobrara).

Comments

Department of Economic Planning and Development

"Since the mid-60's, large numbers of persons without strong community ties have migrated to the Gillette area." What are community ties, how are they measured? Is this statement based on empirical research?

Comment

Department of Economic Planning and Development

An implicit assumption about settlement patterns has been made that the ratio of rural to urban population will remain constant. This means that 22,000 people will be living in Campbell County outside the confines of Gillette. The reasonableness of this assumption should be examined. A similar problem arises in the case of Converse County.

State Recommendation

A paragraph outlining the difficulty of predicting where people will choose to live should be added. This could be very important to towns on the edge of the development area, such as Moorcroft.

Comment

Department of Economic Planning and Development

The arbitrary limitation placed on which developments were to be considered should be stressed when talking about Sheridan County. Development in Southern Montana as well as in Johnson County will almost certainly affect Sheridan. This is part of the settlement pattern problem discussed under the page 557 comment.

Comment

Department of Economic Planning and Development

"The county-by-county employment projecting figures assume the county of employment and residence are coincidental, but where anomalies in this assumption may exist they are pointed out." The anomalies with respect to commuting impacts on Sheridan and other Basin-edge communities has not been pointed out and should be.

Comment

Department of Economic Planning and Development

"Agriculture cannot be expected to offer salaries comparable to those of the energy industry and is expected to lose 12.3 percent of its employment..." It is not clear that the analysis has in fact taken intersectoral labor competition into specific account. The figure cited above apperar to be a trend like figure that would have held without energy development. Energy development may very well accelerate this trend.

Comments

Department of Economic Planning and Development

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p. II-123 "The projected railroad employment ... is based on the employment projection model used by the ... NGPRP." Several models were used by the NGPRP. Presumably the University of Wyoming Water Resources Research Institute model as applied by Matson and Studer is referred to here. The reference should be made more specific.

Comments

Department of Economic Planning and Development

p. II-126 "...the additional tax base for Campbell County is estimated to be \$50,000 and \$98,000 for Converse County." Are these accurate estimates.

Comments

Department of Economic Planning and Development

p. IV-123 "An average annual income of \$14,5000 in 1976 is expected." Since mine in the same area will be paying \$17,793 in 1975(p. III-121), some fairly interesting turnover problems could develop.

Comments

Department of Economic Planning and Development

p. VI-92 Mine employment for 1985 is given as 70 men. Since this mine will be producing 5 million tons by 1985 (p. VI-7), this is a gross productivity of over 70,000 tons per man year. This is a considerably higher estimate than other companies are making. Is it realistic?

Comments

Department of Economic Planning and Development

p. C-76 "The least additional development scenario of the NGPRP has been included in the population and employment projects of this report..." Given the arbitratiness of the NGPRP scenarios, their application to uses such as this is probably fairly risky. In addition, the reasons for choosing the low scenario are not clear.

Comment

37

Department of Economic Planning and Development

page C-77 "Employment for the remaining export sectors of agriculture, railroads... is premised upon a continuation of historic trends..." This is a rather surprising assumption to make in the context of analyzing the impacts of the Burlington Northern, Chicago Northwestern Railroad and associated facilities.

Comments

37

Department of Economic Planning and Development

p. I-454 "The Powder River Basin has traditionally been a ranching area." Oil extraction began in the early 1900's and coal mining also began at the turn of the century. Oil exploration and production can be shown to have been an integral part of the economies of Campbell, Natrona, Weston, and Crook counties. This statement does not seem to be very meaningful.

Later on the same page, "Ranching communities tend to be very stable and very internally oriented." Stability can hardly refer to population stability, since the report has earlier detailed the persistent decline in rural population and number of farms and ranches in the area and agricultuaral employment. "Immigration is rare..." No mention is made, however, of persistent out-migration. In the 1960's, 7 of the 8 counties in the study area had net out-migration.

Comments

Department of Economic Planning and Development

p. I-455 "The magnitude of population increases shattered the traditionally stable population base and destroyed the close knit community character." A more precise definition of terms is necessary if this statement is to have any meaning. What is "community character"? What is "close knit"?

Comments

Department of Economic Planning and Development

p. I-455 "As dominance shifted still further, accomodation shifted from an attempt to assimilate the newcomers into the previous lifestyle to a process of amalgamation between the two opposing lifestyles." How has it been determined that there are two lifestyles? How do we know that they are in opposition?

"While Campbell County has been profoundly affected by mineral development, Converse and the remaining six counties in the basin area have remained relatively undisturbed. Ranching and its attendant lifestyle have retained economic and social dominance." Ranching is most certainly not the economically dominant in Natrona County. This statement is mesleading as to the economic diversity of the entire region's economic structure.

Volume I, Chapter I page I 5 Last paragraph, last sentence

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Comments

Department of Economic Planning and Development

Where did the figure of 5 million tons come from? Best
information we have is approximately 2.5 million.

State Recommendation

Document this volume of coal.

Volume I, Chapter II page I 21 Last paragraph, last sentence

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Comments

Department of Economic Planning and Development

Figures of 12.4, 13.3 and 36.5 billion tons should be documented.
There are published reports that do not agree with these figures.
Eg. Glass-Coal Age-Mid April-1973.

State Recommendation

"Economically strippable coal reserves ---" should be defined.

Volume I, Chapter II page I 22 Middle paragraph

Comments

Department of Economic Planning and Development

The strippable coal reserves are not amendable to underground methods.

Volume I, Chapter II page I 31

Comments

Department of Economic Planning and Development

Figure 3--This figure should be "Production In Millions of Short Tons."

Volume I, Chapter II page I 33

Comments

Department of Economic Planning and Development

Table 2--appears questionable to use figures from reports that are unpublished and still undergoing revisions.

Volume I, Chapter II page I 37

Comments

Department of Economic Planning and Development

Table 4--what other mines are included. Table 3 page I-36 represents less than one-third of cumulative total for 1980.

State Recommendation

This table should be documented as to source.

Comments

Department of Economic Planning and Development

The theoretical railroad capacity of 96 million tons of coal per year seems to be a constraint on the upper level of coal production in the region.

Volume I, Chapter II page I 52

Comments

Department of Economic Planning and Development

Table 5 - The Reservoir Evaporation figure is questionable-- what reservoirs will contribute to this evaporation?

State Recommendation

Environmental Impact Statement should state where and what reservoirs will contribute to this evaporation.

Volume I, Chapter II page I 54 Last line

Comments

Department of Economic Planning and Development

Document the 150,000 AF estimate for ground water recharge.

Volume I, Chapter II page I 56

Comments

Department of Economic Planning and Development

The assumptions on this page must be based on something. Whose mines and whose power plants?

Volume I, Chapter II page I 57 Projected Coal Production for the Study Area.

Comments

Department of Economic Planning and Development

Is this for the entire Powder River Basin of Wyoming or just the specific sites apparently being analyzed. Figures don't agree with either Table 3 p I 36 or Table 4 p I 37.

Comments

Department of Economic Planning and Development

Document the statement of 50% loss in productivity. This statement simply cannot be supported because there is not sufficient information to justify the statement.

Some of the other Analysis Guidelines are probably incorrect. Eg. # 2 and # 3. There might be better use for some of the land than livestock grazing.

State Recommendation

Explain where information for Analysis Guidelines was obtained. Is it arbitrary or is there reason behind them.

Comments

Department of Economic Planning and Development

What was the date of the record 24 hour storm?

Volume I, Chapter IV page I 135 Table 7

Comments

Department of Economic Planning and Development

The power plant in the first half of the table is not identified.
It must be Pacific Power and Light Company's Dave Johnson plant.

State Recommendation

Identify power plant.

Volume I, Chapter IV page I 157 Mineral Resources

Comments

Department of Economic Planning and Development

Who made the estimates on this page?

State Recommendation

Needs to be documented so others can verify these figures to
their own satisfaction .

Volume I, Chapter IV page I 157 figure 7

Comments

Department of Economic Planning and Development

Whose mine and where is it located?

State Recommendation

Needs documentation.

Comments

Department of Economic Planning and Development

This figure of 610 billion tons of coal under less than 3000 feet of overburden in the Powder River Basin of Wyoming is 65 billion tons higher than previously published estimates for the entire state of Wyoming at up to 6000 feet of overburden. These estimates may be correct but they have not been published in any report that we are aware of.

USGS Professional Paper 820, United States Mineral Resources 1973 on page 137 shows 120,656 million short tons of coal for Wyoming with 3000 feet of overburden as of January 1, 1972.

State Recommendation

Document this figure so other investigators can verify the information.

Volume I, Chapter IV page I 183 Table 15

Comments

Department of Economic Planning and Development

Seems unlikely that there are more "surface reserves" than there are "underground reserves" as indicated in this table.

Comments

Department of Economic Planning and Development

On page I 355 the "red cinder cones" are considered as a Geological, Sightseeing experience. In this sentence it appears that this same red clinker does not exist in the present landscape and when used becomes an eyesore.

State Recommendation

This section should at least acknowledge the existence of red clinker hills in the existing landscape.

Volume II, Chapter V page I 523 Paragraph 2

Comments

Department of Economic Planning and Development

Still no documentation on the 50% loss of habitat.

Volume II, Chapter V page I 524

Comments

Department of Economic Planning and Development

Figure 7--no documentation.

State Recommendation

Give a source for this figure. Very little research on revegetation over a period of 20 years has been performed. This must be an assumption on the part of the authors.

Comments

Department of Economic Planning and Development

The 450 and 500 MW plants may be constructed but has any company indicated this or is this just someones guess. To the best of our knowledge the only new power plant in the study area is the 330 MW air cooled plant at Wyodak. The volume of coal projected here as elsewhere in the Environmental Impact Statement is not going to be mined from the 4 projects being analyzed in this statement but rather from several other projects which are not covered in this Environmental Impact Statement as specific sites which makes the entire Environmental Impact Statement rather confusing as to what is being discussed.

State Recommendation

The four specific projects being analyzed should be kept separate from the study area totals since the authors chose not to give an indepth analysis to the remaining projects.

This problem prevails throughout Volumes I and II.

Volume II, Chapter V page I 461-I-462 Plant Stack Emissions--Entire Section

Comments

Department of Economic Planning and Development

Why would anyone assume no stack emission controls when everyone knows that there will not be a coal fired electric plant constructed without these controls. All of the emission figures are totally meaningless because they relate to a situation that will not exist. This section is typical of the Environmental Impact Statement in that it is full of meaningless assumptions apparently designed to confuse the reader.

Volume II, Chapter V page I 467 Paragraph 2 Sentence 2

Comments

Department of Economic Planning and Development

Is a comparison of this area, even with total development, to Los Angeles, California, really valid?

Comments

Department of Economic Planning and Development

Apparently there is considerable doubt as to what the ambient air quality will be?

Volume II, Chapter V page I 475 Paragraph 1 Sentence 2

Comments

Department of Economic Planning and Development

Report should be consistent, here it is 1,543 million tons by 1990, in other sections it is 1.5 billion. Probably not significant but should use same figure throughout.

Volume II, Chapter V page I 477 Last paragraph Last sentence

Comments

Department of Economic Planning and Development

Last three words: an example of assuming the worst. The loss could be significant, the loss could also be insignificant but in this Environmental Impact Statement the worst is always assumed.

Volume II, Chapter V page I-479 Paragraph 1 Last two sentences

Comments

Department of Economic Planning and Development

Granted 1.5+ billion tons of coal will be removed and consumed but what value does this 1.5+ billion tons of coal have if it is not eventually mined and consumed. If this coal resource is not utilized then we have simply wasted a valuable energy resource.

Volume II, Chapter V page I 483 Paragraph 3 Sentence 3

37

Comments

Department of Economic Planning and Development

Should this sentence read "with difficulty" or without difficulty.

Volume II, Chapter V page I 489 Table 9

Department of Economic Planning and Development

State Recommendation

This table needs to be documented as to source of information.

Volume II, Chapter V page I 495 Paragraph 1

Comments

Department of Economic Planning and Development

If there are no perennial streams in the vicinity of the proposed mines, why the discussion on streams gaining or losing water to or from the mined area. Appears to be another attempt to confuse the reader.

Volume II, Chapter V page I 499 Ground Water Sentence 1

Comments

Department of Economic Planning and Development

This statement would only be true if the coal seam to be mined is below the water table. This fact has not been established in the Environmental Impact Statement.

Volume II, Chapter V page I 510

Comments

Department of Economic Planning and Development

A good example of a positive impact.

Comments

Department of Economic Planning and Development

Of what value is the coal resource if it is not developed and utilized. An example of repetitive nature of Environmental Impact Statement, as this was already stated on I-479.

Comments

Department of Economic Planning and Development

What value do historical sites have if they are not visited and utilized. More people will have an opportunity to learn about the history of the area which has to be a social positive result of the projected development.

Comments

Department of Economic Planning and Development

No new development is totally unrealistic and is not a true alternative.

Volume II, Chapter VIII page I 695

Comments

Department of Economic Planning and Development

Alternate Mode of Distribution. Are these really alternatives or simply part of the overall distribution systems. It seems that all of these will be utilized to some extent.

Volume II, Chapter VIII page I 702

Comments

Department of Economic Planning and Development

Alternative to Private Development. There does not seem to be any advantage to a federal coal mining operation. It would probably have the same impact as a free enterprise system and would be of less benefit to the state and local areas since it is doubtful if the federal government would submit to paying the same taxes as private industry. The entire section implies that the federal government knows best and this cannot be supported by examining any existing federal program. The federal government already has a myriad of laws, rules and regulations that is almost to the point of restricting any development.

State Recommendation

This section should be removed from the Environmental Impact Statement. The Environmental Impact Statement should not recommend a federal coal authority but should stay with the stated objectives of analyzing impacts.

Comments

37

Department of Economic Planning and Development

These are not alternative sources of energy but are sources of energy that should be developed in conjunction with the coal of the Powder River Basin. It should be very obvious to anyone who makes any effort to understand the current energy crisis that there is no one or two sources of energy that will ever supply the needs of the nation. All of these so called alternatives should be developed as soon as possible to reduce the dependence of the nation on any one or two sources of energy.

State Recommendation

The Environmental Impact Statement should consider an accelerated Research and Development program on these so called alternatives so that the demand on Powder River Basin coal would be reduced.

Comments

Department of Economic Planning and Development

The area will be changed but to state that it will be completely different is not realistic.

The area will change but there will still be farmers, ranchers, deer and antelope and a considerable area of wide open spaces.

State Recommendation

This section should be modified to state that the area will undergo significant changes.

Volume II, Chapter IX page I 859 Paragraph 2 Sentence 4

Comments

Department of Economic Planning and Development

What is the figure? 1.5 billion? 1,543 million? or 1,540 million?

State Recommendation

Should be consistent throughout the Environmental Impact Statement.

Comments

Department of Economic Planning and Development

This is at least the third time this has been stated.

State Recommendation

Eliminate the repetition.

Comments

Department of Education

37

The authors of this draft statement were charged with the task of studying the environmental impact of the projected economic development on the Eastern Powder River Basin. One of their conclusions appears to be that this new development will have substantial adverse effects on the environment, many of which are unavoidable (e.g., air quality.) Despite these unavoidable harmful effects, the authors argue that this new development should proceed because there is no acceptable alternative (or combination of alternatives) for meeting the nation's energy demands. This reasoning is partly based on the assumption that society's demand for energy will continue to expand and can be partially satisfied by the mining of the coal resources of the Basin.

The Department of Education is very much concerned (as are the school superintendents of the region) about the impact of new economic development on the Powder River Basin. We agree with the authors of this study that there will be substantial people impact, especially on the area's public schools. We are frustrated, however, because there seems to be so little accurate information available concerning industry's plans. Feedback recently received from local school superintendents indicates that there may be even more economic development than has been projected in this study. If their information is correct, then the population projections found in the draft statement may be grossly inaccurate. Education cannot plan school facilities and programs for kids - involving millions of dollars - on the basis of such flimsy information.

Recommendations

Department of Education

Assuming that the statistics used in this study are reasonably accurate and that substantial new economic development will take place, then the Department supports the concept of limited (restricted) development of the Basin's mineral resources. Restricted development would allow industry and government adequate opportunity to develop the long-range plans necessary to meet the problems created by impact (e.g., local school districts could more accurately plan the additional programs and facilities required to serve the larger school populations.) Development should not be allowed to take place at a pace faster than what local governments can provide the necessary services required to support the local population. Only chaos can result from unrestricted economic development (e.g., Rock Springs.)

The Department further believes that restricted economic development would allow sufficient time for the people of this nation to reexamine the lifestyle (value system) which has led to an unsatisfiable thirst for energy. Nothing described or projected in the draft statement is inevitable or irreversible. All ideas and assumptions should be open to discussion and change if the welfare of the nation is at stake.

37

Comments

Department of Education

The Department agrees that Campbell and Converse Counties will receive the most substantial impact from student enrollments. However, the area school superintendents disagree with the statement made on the above pages which says that "population increases due to coal and energy related developments in the region will have very minimal, if any, impacts on public education in these countries." Implied in this statement is the assumption that those persons working in a county will, for the most part, reside in that county. That being the case, then there will be little population spillover into the surrounding counties coming from the new economic development projected for Campbell and Converse Counties. Dr. Henderson, the school superintendent in Converse County District #2, has conducted a survey which shows that 70% of those persons employed in the fossil fuel industry in his district actually live in Casper. If the assumption cited above is incorrect, then the population projections for the surrounding counties of Johnson, Natrona and Crook Counties may be considerably low. For example, Table 18, page I 579 the prediction is made that there will be a decrease in student enrollment in the Crook County district; local school superintendents believe that the Moorcroft attendance center will experience a substantial increase in enrollment due to impact in Campbell County. It also needs to be pointed out here that a small percentage increase in student enrollment for a small school district may result in a substantial impact for that district. Therefore, statistics can be misleading.

In addition, it should be noted that the draft statement does not take into consideration projected economic development for the area that will occur on private land (e.g., the Texaco development in Johnson County near Lake de Smet.) This development will also have substantial impact on schools and needs to be taken into consideration by local school people in planning school facilities and programs. For example, Mr. Rich Douglas, the Johnson County planner believes that the school enrollment in Johnson County will increase by slightly more than 100% between 1974 and 1980 (the draft statement predicts a 53% increase due to development of Campbell County. He concludes then that school enrollments would far exceed the capacities of existing school facilities (e.g., he projects an enrollment of 1887 at the elementary level - present capacity is 800; 848 at the junior and senior high levels - 550 is the present capacity.) In addition, Mr. Douglas predicts a steady increase in student enrollment through 1986 (the draft statement predicts a slight decrease in enrollment after 1980.)

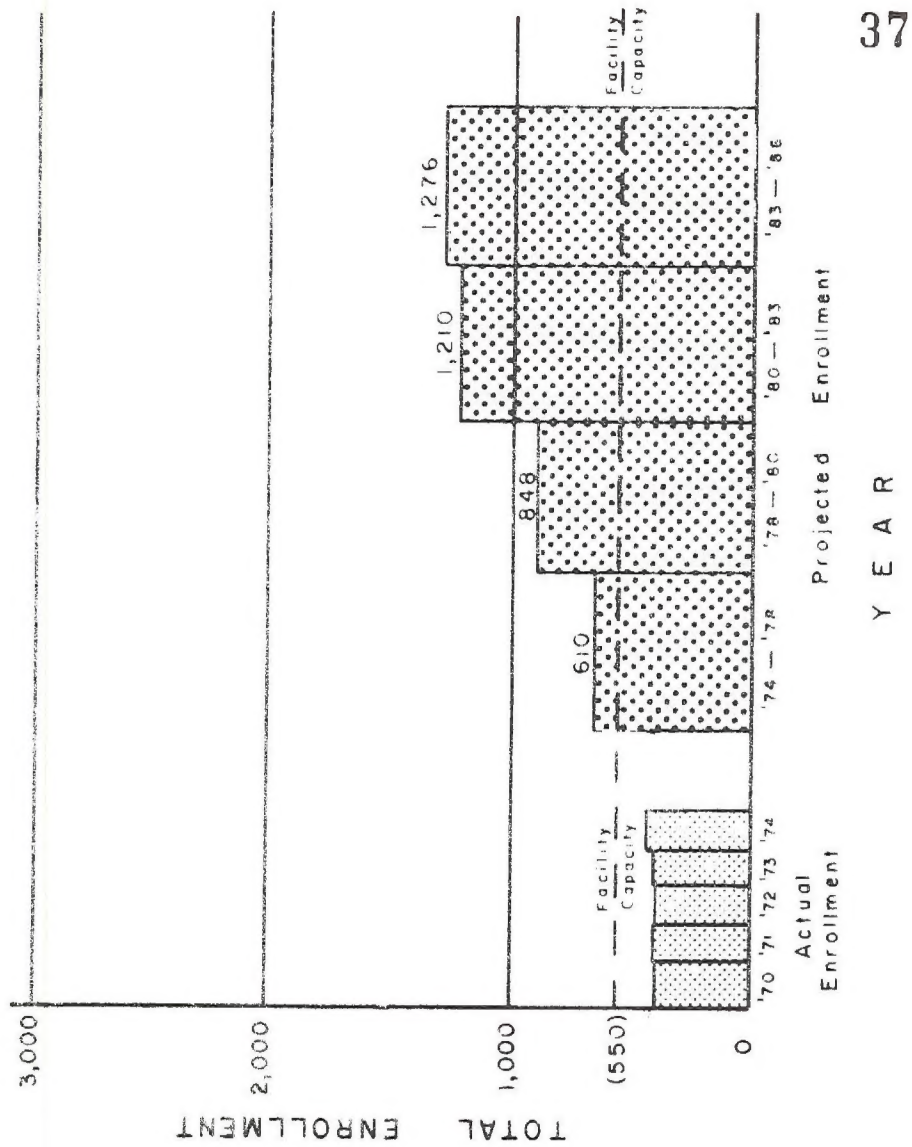
Recommendations

Department of Education

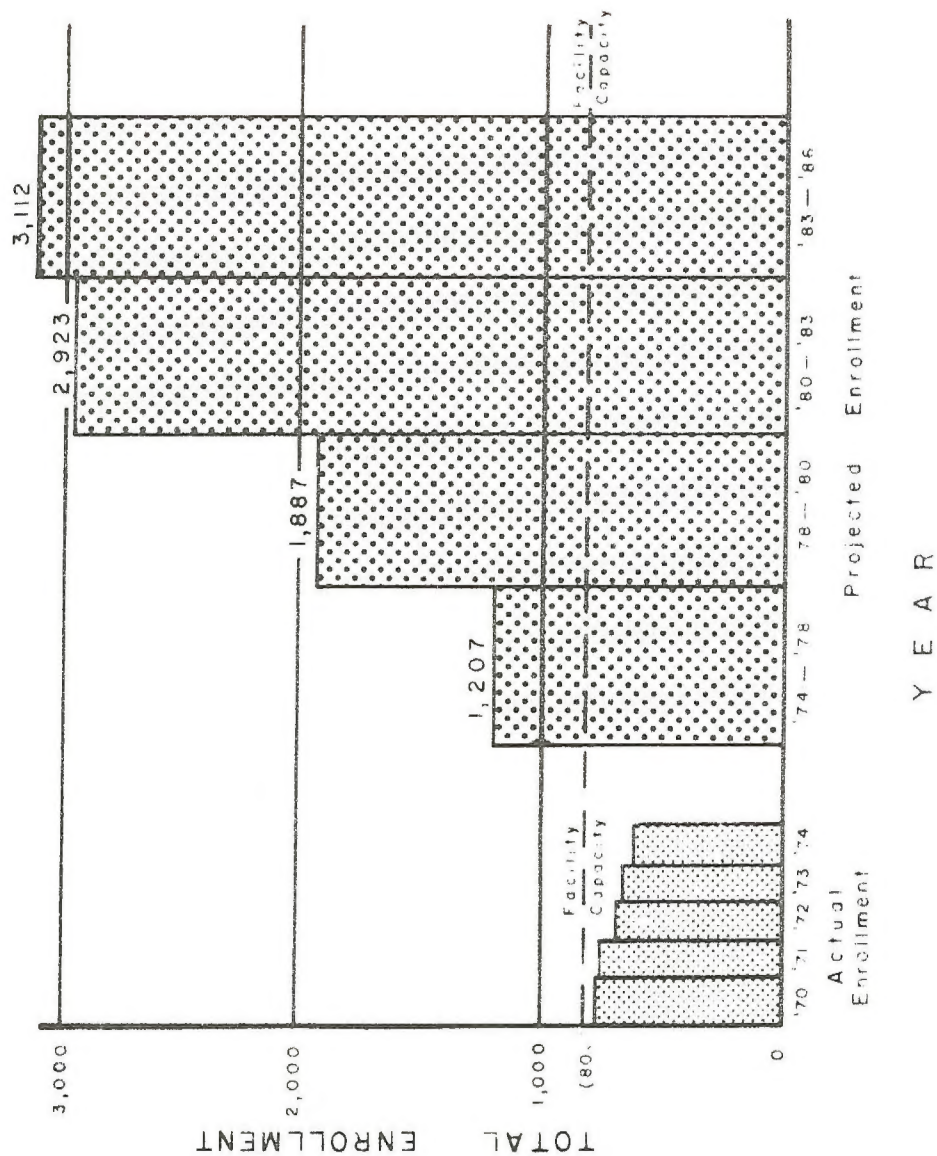
37

The Department realizes that the authors of the draft statement were not charged with conducting an impact study relative to new economic development on private land. However, state and local governments must consider all facets of economic activity in the Basin before developing plans to deal with its effects. This fact, when combined with the differences in population projections cited previously points out how difficult it is to systematically plan to meet the educational needs of the local communities. Without sufficient "lead time" and the cooperation of industry, it is nearly impossible to do so. Restricted or curtailed economic development would allow state and local governments sufficient time to develop the plans necessary to deal with the effects of impact.

BUFFALO HIGH SCHOOL



BUFFALO ELEMENTARY SCHOOL



General Comments

37

Comments

State Engineer's Office

This draft statement gives little consideration to applicable State Water Law with regard to interference with existing water rights, both surface and ground water, from mining activities or the necessity for securing water right permits when water is to be impounded or utilized from either surface or ground water sources.

State Recommendation

It is recommended that a paragraph be added in Volume II, Chapter VI, "SIGNIFICANT MITIGATING MEASURES", to spell out the requirement for water right filings for water impoundments and the general utilization of water from ground water or surface water sources, including by-product water. It should also be brought out that if the mining activity interferes with existing surface and ground water rights, it may be required that water be provided to satisfy these rights.

Also Volume II, Chapter VII, "PROBABLE ADVERSE ENVIRONMENTAL AFFECTS WHICH CANNOT BE AVOIDED", should be appropriately modified on page I 653, "Water Resources", to bring out that satisfactory arrangements must be made to eliminate or minimize interruption of aquifers or depletion of stream flows.

This same general theme should be incorporated in the appropriate places in the draft statement.

Comments

State Engineer's Office

Mention is made several times throughout the draft statement of the requirement for the installation of hydrologic monitoring wells along with pumping tests and the installation of surface water pumping tests to determine the affects of the mining activities on ground water aquifers and both ground water and surface water quality and quantity. Since both the Wyoming State Engineer's Office and the Wyoming Department of Environmental Quality have responsibility in the area, monitoring activities should be coordinated with the appropriate agency.

The various sections throughout the draft statement dealing with "Monitoring" should be modified to bring out that monitoring activities will be coordinated with the Wyoming State Engineer's Office and Wyoming Department of Environmental Quality.

Comments

State Engineer's Office

No mention is made in the chapters on "MITIGATING MEASURES" of the fact that under Wyoming water law it is possible to change the location of a well, a reservoir or irrigated lands that are affected by such activities as mining. This would prevent the loss of these facilities and of irrigated lands, in many instances, and reduce the impact of the mining activity.

State Recommendation

The draft statement should be modified to incorporate the possibility of reduction of the impact of mining activity through replacement of wells, reservoirs or irrigated lands where it is feasible.

Volume I, Chapter I page I 12 Paragraph 1 Under heading
State Agencies

Comments

State Engineer's Office

This statement infers that State agencies have incomplete or indefinite control over the development described. We do not agree with the implication that there is a lack of State authority and control over developments set out in the Impact Statement.

State agencies have definite authority under State law, and while there may be overlapping Federal-State authority, the State nonetheless has specific and definite jurisdiction and control over vital elements of development.

State Recommendation

A number of State agencies also have control over the development described in this statement.

Volume I, Chapter I page I 13 Paragraph 2

Comments

State Engineer's Office

This paragraph is incomplete since it does not indicate that the Board of Control is responsible for amendment or transfer of existing water rights which are of an adjudicated or "finalized" status.

State Recommendation

The Wyoming State Engineer and the Wyoming State Board of Control administer State water laws which regulate use of surface and ground waters of the State. Applications for new water rights are filed with the

State Engineer and petitions for transfer of existing water rights with the State Engineer or the Board of Control depending on the status of the existing rights. Requests are normally approved if it is determined that approval will not jeopardize prior water rights.

Volume I, Chapter II page I 48 Figure 3

Comments

State Engineer's Office

The heading on the left of the chart should be in "thousands" of short tons, or three ciphers should be dropped from the figures on the left, and the heading should be in "millions" of short tons.

Volume I, Chapter II page I 50 Paragraph 1

Comments

State Engineer's Office

In the second line the word "salty" is misleading and difficult of definition.

State Recommendation

Drop the word "salty" from this sentence.

Volume I, Chapter II page I 53 Last paragraph

Comments

State Engineer's Office

While water for Panhandle Eastern's proposed reservoir might be physically diverted from the North Platte River, it would not be appropriated from that source most of the time since only rarely is there water available over and above that necessary to satisfy existing water rights. Water would instead come from transfer of irrigation rights or water from other sources.

State Recommendation

The last complete sentence in this paragraph should be modified as follows:

"Water for the reservoir could come from the North Platte River but would not come from water appropriated from the River the majority of the time but instead come from transferred irrigation rights or water from other sources."

Volume I, Chapter II page I 54 Last complete paragraph

Comments

State Engineer's Office

The meaning of the last sentence of this paragraph beginning, "An exchange of use...." is not clear. This should be expanded and the meaning clarified.

Volume I, Chapter II page I 54 Last paragraph

Comments

State Engineer's Office

The source of information for the estimated annual recharge to ground water should be identified. Also is this estimate for total recharge to all aquifers, one aquifer...?

Volume I, Chapter IV page I 115 Paragraph 1 Line 6

Comments

State Engineer's Office

Should not the word "eastern" be "western" Wyoming?

Volume I, Chapter IV page I 258 Last paragraph

Comments

State Engineer's Office

This paragraph comments on water rights but deals only with surface water. The control of ground water also rests with the State Engineer by statute. Another paragraph should be added to bring this out, or this paragraph should be added to page I 230 just ahead of the section labeled, Surface Water.

State Recommendation

The appropriation of and supervision and distribution of ground water is under control of the office of State Engineer and the Board of Control. An appropriation of ground water is secured by proper application filed with the State Engineer. Ground water is distributed generally on a priority basis.

Volume I, Chapter IV page I 261 Paragraph 2

Comments

State Engineer's Office

The State of Wyoming generally objects to any assertion of so-called "reserved" rights which would expand the concept of such reservations beyond the

scope of the original purpose of such reservations.

It should also be pointed out that there is no such thing as a "Federal water right" as that term is understood in the West.

While Federal rights to the use of water have been obtained in various ways, the only true water rights of record are those obtained pursuant to State law.

Federal "reservations" of navigational uses are uses obtained pursuant to Constitutional provisions or court-created theory. In essence reservations especially are prescriptive uses which are not recognized as valid under Wyoming or the majority of western water law.

Volume I, Chapter IV page I 262 Second complete paragraph
Line 2 and page I 265 Last complete paragraph Lines 5,6

Comments

State Engineer's Office

The North Platte River is not governed by Interstate Compact but is instead operated under terms of 1945 and 1952 United States Supreme Court Decrees.

State Recommendation

On page I 262 the word "and" should be inserted after the words "Green River" and a period inserted after the words "Snake River". The phrase "and the North Platte River" should be stricken.

On page I 265 strike the words "by interstate compact agreements between Wyoming and Nebraska" and substitute the words "because of operation of the River under terms of a United States Supreme Court Decree".

Volume I, Chapter IV page I 379 Last paragraph Second sentence

Comments

State Engineer's Office

This sentence is incomplete, and the meaning is lost.

Volume II, Chapter V page I 491 First complete paragraph

Comments

State Engineer's Office

The second sentence of this paragraph is misleading. It is believed that the intent of this sentence is to give a general indication of the amount of water consumed by irrigation of 12,000 acres at a consumptive use rate of about 1.1 acre-feet per acre. (See I 546 and I 547.)

State Recommendation

If this is the case, this sentence should be rewritten as follows:

"Industrial companies have already purchased over 12,000 acres of irrigated lands, which would consume 13,200 acre-feet of water if a consumptive use rate of 1.1 acre-feet per acre is assumed."

Volume II, Chapter V page I 491 Last two paragraphs

Comments

State Engineer's Office

Another possible alternative for disposal of cooling waste water might be to reduce the number of times this water is recycled so that the quality of water remains good enough for disposal by irrigation.

Volume II, Chapter V page I 501 Next to the last paragraph
Lines 5,6

Comments

State Engineer's Office

Only one request has actually been filed for change to industrial use, and this involves slightly over 2000 acres. The one million acre-foot figure is completely erroneous.

State Recommendation

Requests have been filed with the State Engineer for a change involving slightly over 2000 acres.

Volume II, Chapter V page I 528 First full paragraph
Last sentence and page I 539 First paragraph Fourth
sentence

Comments

State Engineer's Office

Only one request has actually been filed for change to industrial use, and this involves slightly over 2000 acres. The 1.5 million acre-foot figure is completely erroneous.

State Recommendation

One request has been filed with the State Engineer for a change in water use from agriculture to industrial use involving slightly over 2000 acres.

General Corrections
State Engineer's Office

Volume II, Chapter VIII page I 746 Line 3

"halt" not "half"

Volume II, Chapter VIII page I 830 Last paragraph Line 3

"reproduction" not "reporduction"

Volume II, Chapter VIII page I 847 Last paragraph Line 9

"3000° F" not "3000o F"

Volume III, Chapter II page II 63 Lines 3,4,5

Comments

State Engineer's Office

The correct designation is "South Fork Cheyenne River".

State Recommendation

With the exception of Shawnee Creek, all the major streams drain in an easterly direction into the South Fork Cheyenne River which flows eventually into the Missouri River in South Dakota.

Volume III, Chapter II page II 64 Last paragraph and page II 97 Second Paragraph

Comments

State Engineer's Office

The right to the use of any water must be acquired by appropriation under State law where water is available or by "temporary use agreement" in areas where all water is already appropriated. This can be brought out by adding a phrase to the last sentence on II 64. This entire sentence should also be added to the second paragraph on page II 97 after the word "railroad".

State Recommendation

Acquisition of the required amount of water is not considered to be a problem but must be in conformity with State water law.

Volume III, Chapter IV page II 141 First full paragraph
Line 3

Comments

State Engineer's Office

The right to the use of any water must be acquired under the appropriate provisions of State water law. The landowner will generally be involved in some manner, but this will vary according to the circumstances.

State Recommendation

In the first sentence strike the words "without written authorization of the authorized officer or the landowner" and substitute the following after the word "facilities": "except in conformity with State water law".

Comments

State Engineer's Office

Spelling -- the word "fork" not "form"

Volume III, Chapter I page III 1 Paragraph 1 Line 5 and
Paragraph 3 Line 3

Comments

State Engineer's Office

"T.43N." not "T.42N."

"T.43N." not "T.34N."

Comments

State Engineer's Office

The boundary shown on this figure does not correspond to that shown on figure 2, page III 28.

Volume III, Chapter II page III 90 Last paragraph and/or heading Ownership

Comments

State Engineer's Office

Should not the word "state" be the word "lease"?

Volume IV, Chapter II page IV 47 Line 2

37

Comments

State Engineer's Office

Insert "R.71" after "52N.".

Volume IV, Chapter II page VI 23 Figure 2 Last line

Comments

State Engineer's Office

Spelling -- "General" not "Generl"

Comments

Department of Environmental Quality

The second sentence of the second paragraph mentions that the "Clean Air Act requires that any entity proposing a new industrial facility (power plant, gasification plant) must obtain a permit certifying that the plant complies with EPA's new source performance standards."

Gasification plants are not included in the thirteen categories for which new source performance standards are specified. Reference: Volume 36, No. 247, December 23, 1974 and Volume 38, No. 111, June 11, 1973 Federal Registers.

Additionally, any facility having the potential to cause the issuance or an increase in the issuance of air contaminants must obtain a construction permit from the Wyoming Department of Environmental Quality. Operating permits are also required of all mobile sources and permanent sources after an initial 120 day start-up period. Reference: Wyoming Air Quality Standards and Regulations, 1974, Section 21 (a).

Lines 8 and 9 says that "EPA effluent guidelines and standards determine whether any specific permit may be issued." Permittees must comply with state and federal standards, and in the case of operating permits, the EPA does not have a similar requirement on the federal level.

Lines 9, 10 and 11 mention that it is possible for delegation of authority from EPA to Wyoming. The Wyoming Environmental Quality Act grants authority to the Department of Environmental Quality to institute permit systems in air, land and water quality matters. Compatibility with the coverage of EPA's permit system gives the state the prime responsibility and authority in the air and water permit programs, but the last sentence, (line 11 and 12) is accurate.

State Recommendation

The above mentioned changes should be incorporated to more accurately reflect requirements of the air and water quality permit programs.

Comments

Department of Environmental Quality

In paragraph 2, under State agencies, lines 9 and 10 mention that permits and a license to mine are required. No mention is made of the requirement for a permit being required to engage in mineral exploration by dozing. Reference Section 35-502.31 Environmental Quality Act and the reclamation of abandoned drill holes as specified by 30.96.16 of the statutes.

Lines 12 and 13 refer to "regulations under the Act which became effective July 1973." This may have reference to Air Quality Standards and Regulations which became effective on June 3, 1974 and which are "issued" for general distribution. Land quality regulations scheduled for public hearings in late July, 1974 will be adopted and distributed soon thereafter.

State Recommendation

Revision of the above mentioned lines to include the additional material.

Volume I, Chapter IV, pages I-290 and I-291

Volume I, Chapter V, pages I-509, and I-637 and I-656

Comments

Department of Environmental Quality

These pages describe the sites which may have historical and archaeological value and procedures to be followed by developers in considering such properties for minimizing adverse effects.

No reference is made to the requirements of Wyoming's law EQA Section 35-502.12 (a)(v) whereby the Environmental Quality Council designates "areas of the state which are of a unique and irreplaceable, historical, archeological, scenic or natural value."

The resolution (copy attached) passed by the Council on January 25, 1974 requires definite obligations on the part of developers to consider such areas. Mining and reclamation plans are reviewed in this regard by the state Recreation Commission, the Archives and Historical Department and the Anthropology Department of the University of Wyoming.

WHEREAS, the Wyoming Environmental Quality Council is charged by Section 35-502.12 (a)(v) of the Environmental Quality Act of 1973 with the responsibility to "designate to the extent possible those areas of the state which are of a unique and irreplaceable, historical, archaeological, scenic or natural value," and;

WHEREAS, the approval of any application for a mining permit under the provisions of Section 35-502.24 (g)(iv) of this Act must assure that "the proposed operation will not irreparably harm, destroy, or materially impair any area that has been designated by the Council to be of a unique or irreplaceable, historical, archaeological, scenic or natural value," and;

WHEREAS, the Council through its individual members and the Department of Environmental Quality regard this mandate to be vital in carrying out policies and purposes of the Act as stated in Section 35-502.2 to plan "the development, use, reclamation, preservation and enhancement of the air, land and water resources of the state," and "to secure cooperation between agencies of the state in carrying out these objectives."

NOW THEREFORE, IT IS RESOLVED THAT any place, site or area which is of a unique, irreplaceable, historical, archaeological, scenic or natural value shall be identified and referred to as a "restricted area."

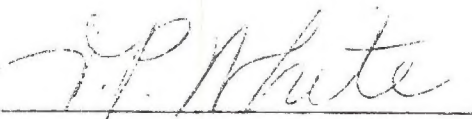
IT IS FURTHER RESOLVED THAT the initial designation of restricted areas in Wyoming shall include but shall not be limited to those places which are now or hereafter included in the Wyoming Recreation Commission Inventory of Historical Places, the U.S. Department of Interior National Register of Historical Places, national and state parks, national and state wildlife refuges, National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, National and State Recreation areas, monuments, forts, museums, ranger stations, petroglyph sites, dams, depots and any area which may adversely affect a publicly owned park, or sites and places listed by the University of Wyoming Department of Archaeology, the Wyoming Recreation Commission, and the Wyoming Archives and Historical Department.

IT IS FURTHER RESOLVED THAT this designation shall also include sites and places identified by mining permit applicants within the proposed development area as having more than local interest and importance as a restricted area.

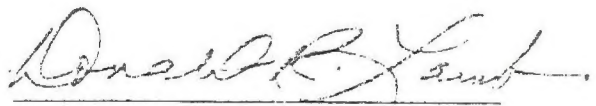
IT IS FURTHER RESOLVED THAT areas designated herein and any other area may be evaluated by the Council at any time to determine their inclusion or exclusion as restricted areas.

ADOPTED BY THE WYOMING ENVIRONMENTAL QUALITY COUNCIL on this 25th day of January, 1974.

Attested to by the Secretary



Donald P. White
Wyoming Environmental Quality Council



Donald R. Lamb, Chairman
Wyoming Environmental Quality Council

Permit applicants are required to notify these agencies if archeological materials are encountered during the course of the operation.

State Recommendation

Reference to the above listed requirements be included as a part of these chapters.

Volume I, Chapter III, page I-114

Comments

Department of Environmental Quality

This page has a statement indicating that waste from construction sites would be disposed of by open burning in remote areas. This practice is prohibited by Section 13 b (1) and (2), Wyoming Air Quality Standards 1974 unless special permission is secured from the Department.

State Recommendation

A statement may be more appropriate which specifies that disposal of construction site wastes be accomplished in accordance with state air quality and solid waste management standards. If burning is contemplated as a disposal method, permission may be secured under certain specified conditions. If a solid waste management site (landfill) is considered, approval of the site is required under Article 5 of the Environmental Quality Act.

Volume I, Chapter II, page I-59

Comments

Department of Environmental Quality

This page lists the Analysis Guidelines for the Impact Statement.

Item 3 states that "Mines areas will be reclaimed for livestock grazing (grass species)."

Under Wyoming law (EQA 1973) reclamation is defined as "the process of reclaiming an area of land affected by mining to use for grazing, agricultural, recreational, wildlife purposes, or any other purpose of equal or greater value."

Reclamation must also restore the "land to a use at least equal to its highest previous use."

In instances where a prior use was other than grazing, the reclamation plan must describe such use and outline a plan for reclaiming the surface to an acceptable "proposed future use or uses."

State Recommendation

That the requirements of Sections 35-502.3 (e)(i), 35-502.21 (a)(i) (ii) and 35-502.24 (b) of the Environmental Quality Act 1973 be considered so that operators will be aware that acceptable reclamation might not be limited to livestock grazing as the only approvable use.

Volume I, Chapter I, pages I-14 and I-15

Comments

Department of Environmental Quality

These pages refer to performance bonds to assure compensation for surface damage to a landowner's estate. No mention is made of the provision for the Environmental Quality Council to grant permission to mine in lieu of the landowner's consent.

State Recommendation

Include the information contained in Section 35-502.24 (b) (x) (A) (B)(C) and (d) whereby permission to mine may be granted by the Council in lieu of a landowner's consent if certain conditions by the permittee are met. These include submittal of detailed plans (mining and reclamation) to the landowner, guarantees that the surface use by the landowner is not impaired and that the land be reclaimed to its approved future use.

Comments

Department of Environmental Quality

This draft statement suggests that unregulated emissions will be allowed, and impacts are calculated without control measures at the source. This concept is contrary to state and federal requirements for air and water quality.

Meteorological predictions on inversion conditions must necessarily be based on limited data secured at stations somewhat distant from the development area.

The predicted drop in vegetative productivity appears to be in significant conflict with revegetation studies made by the University of Wyoming plant biologists and actual experiences in adjacent surface mined areas.

State Recommendation

The statement makes the basic premise that all impacts are detrimental with respect to environmental considerations. Wyoming ranks uses of land in a diminishing order of significance and importance of such use. In certain instances, it is considered highly probable that a higher use can be attained after reclamation. There is no reference to this probability and it would seem reasonable to include this as a possibility with respect to surface reclamation of disturbed lands.

July 22, 1974

Comments from the Land Quality Division,
Environmental Quality Department

In reviewing and assessing the draft environmental impact statement "Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming," prepared under the direction of the U. S. Bureau of Land Management numerous statements of questionable validity were noted with respect to mine land reclamation and the physiographic effects of mining in the Eastern Powder River Basin. The statement indicates that certain environmentally detrimental procedures will take place which would be in direct violation of the 1973 Wyoming Environmental Quality Act. The attached report briefly describes some of the major items of concern noted in Volumes 1 and 2 of this statement.

Comments

Land Quality Division, Environmental Quality Department

The Environmental Impact Statement indicates the following: "The Land Quality Division issues permits and licenses to mine upon its approval of a mining and reclamation plan submitted by the applicant. Licenses to mine may be revoked or suspended for substantial violation of their terms. Regulations under the Act, which became effective July, 1973 have not yet been issued."

State Recommendation

The second draft as amended of the regulations to accompany Article 4 of the 1973 Environmental Quality Act have been made available for public review. Public hearings concerning the regulations will be held July 29 and 30, 1974, in Casper, Wyoming.

The following should also be indicated: each mining permit applicant must post a performance bond with the State of Wyoming in an amount determined on the basis of accepted engineering practices by the Land Quality Division for the purposes of insuring mine land reclamation.

Comments

Land Quality Division, Environmental Quality Department

On these pages numerous references are made to the number of acres of land that will be affected by pipelines, transmission lines, etc.

State Recommendation

An explanation should be given concerning how these acreages were determined. Certainly the land under power lines will not be removed from use and in that pipelines will be buried the land surrounding and over pipelines will be reclaimed immediately after burial. Therefore, this disturbance will be very temporary.

Comments

Land Quality Division, Environmental Quality Department

The provisions of the Environmental Impact Statement are based on the assumption: "The level of mining technology will not change significantly through 1990."

State Recommendation

This assumption is not a reasonable assumption. This assumption should be explained as to basis. One would hope that mining technology will improve in the next 15 years.

Volume I, Chapter III Page I 59 Paragraph 3

Comments

Land Quality Division, Environmental Quality Department

The provisions of the Environmental Impact Statement are based on the assumption "Mine areas will be reclaimed for livestock grazing (grass species)."

State Recommendation

This assumption is not entirely true as can be observed by reading the reclamation proposals of the mining companies involved in coal mining in the Powder River Basin. The 1973 Wyoming Environmental Quality Act requires that land affected by mining be returned to a use equal to or higher than the use of the land prior to mining. The procedure for attaining this goal must be thoroughly explained in the operators reclamation plan which must be approved prior to commencement of the mining operation. This would indicate that any productivity loss due to mining will be regained if not increased after mining. This is insured by the fact that the 1973 Wyoming Environmental Quality Act requires all mining operations in the state be bonded in an amount to reclaim all affected land to the above noted condition.

Comments

Land Quality Division, Environmental Quality Department

The provisions of the Environmental Impact Statement are based on the assumption: "There will be a 5-year time lag in reclamation efforts for mined areas. After first 5 years, the same amount of area mined will be reclaimed each year."

State Recommendation

This assumption is not necessarily true. It has been demonstrated by Amax at the Belle Ayr South mine that reclamation will not require 5 years. This 5 year time lag may be true in some areas, but not all areas. The 5 year schedule for restoration can be stepped up from 5 to possibly 3 years in many cases, if grading and contouring, mulching and seeding take place at the same time.

Comments

Land Quality Division, Environmental Quality Department

The provisions of the Environmental Impact Statement are based on the assumption "There will be a 50% loss in productivity for grazing purposes. This will occur even if the entire area is revegetated."

State Recommendation

This assumption contradicts other statements in the Environmental Impact Statement and is not substantiated anywhere with a factual quantitative explanation. A description of the time period for which this 50% loss will apply and the exact areas involved should also be given.

Comments

Land Quality Division, Environmental Quality Department

The Environmental Impact Statement indicates the following: "No underground development or mining has been proposed for uranium, sand and gravel, bentonite, or clinker deposits in this area."

State Recommendation

Exxon Uranium and Kerr-McGee have plans for underground uranium operations north of Douglas.

Comments

Land Quality Division, Environmental Quality Department

The Environmental Impact Statement states: "Based on the assumption that the best technology will be applied an estimated 70 to 80 percent of the mined land surface would be expected to be successfully rehabilitated under existing climatic and soil conditions."

State Recommendations

This comment requires some factual quantitative explanation.

Comments

Land Quality Division, Environmental Quality Department

Within this paragraph the assumption is made that there will be no reshaping of spoil areas.

State Recommendation

It is the policy of the Land Quality Division, Environmental Quality Department that within each reclamation plan an explanation of grading and contouring spoil areas be given. Therefore, the state will require that spoils be shaped.

Comments

Land Quality Division, Environmental Quality Department

Within this paragraph it is indicated that considerable erosion will take place if the spoil piles and soil piles are not protected by water or grass.

State Recommendation

The 1973 Wyoming Environmental Quality Act requires that a quick growing protective vegetative cover be established on all topsoil and spoil areas. It also provides for the necessity of watering stockpiled material, roadways, etc. to protect from wind erosion.

Volume II, Chapter V Page I 475 Paragraph 1 and 2

Comments

Land Quality Division, Environmental Quality Department

Within these paragraphs the Environmental Impact Statement indicates that the proposed mining operations "will destroy all of the soil characteristics, micro-organisms and climatic relationships which have been established over a long geologic time span. The current soil productivity will be lost for an indefinite period. . . Properties of topsoil will be destroyed by mining on 14000 acres by 1990. . . Removal of overburden will result in complete destruction of soil horizons, parent material, and soil characteristics. It could result in bringing to the surface elements, such as boron, which may be toxic to plant growth.

State Recommendation

The 1973 Environmental Quality Act requires that all mine operators save and stockpile all topsoil separate from overburden and spoil material. The topsoil must be covered with a quick growing vegetative cover to protect it from wind and water erosion and the topsoil stockpiles must be clearly marked to avoid confusion with overburden or spoil piles. Should the topsoil be leached of any nutrients while being stored the operator will be required to fertilize the soil in order to restore these lost nutrients.

The writer of this section should refer to the section of the Environmental Impact Statement describing the characteristics of the existing soils in terms of poor to moderate soil horizon development and productivity. On this basis the impact might not appear to be so drastic.

State Recommendation (Continued)

The 1973 Wyoming Environmental Quality Act requires that all operators describe any potentially toxic material which may be uncovered in mining along with the operators plans for eliminating or minimizing the affects of this material in the operators approved reclamation plan. All operators must report the occurrence of any unexpected toxic materials uncovered during mining to the DEQ for instruction as to proper removal or disposal so as to eliminate the potential of contamination of surface material. On this basis, it is believed that this will not pose as great a problem as indicated in the Environmental Impact Statement.

Volume II, Chapter V Page I 477 Paragraph 1

Comments

Land Quality Division, Environmental Quality Department

This paragraph indicates that soils and spoils will be exposed to considerable erosion and destruction.

State Recommendation

The 1973 Wyoming Environmental Quality Act requires protection of topsoil and spoil areas from wind and water erosion by establishment of a quick growing vegetative cover on these areas.

Volume II, Chapter V Page I 516 Paragraph 2

Comments

Land Quality Divison, Environmental Quality Department

This paragraph indicates "Senic views will be changed. Indicators of this change will be unregulated solid waste disposal and litter near plants and communities. . ."

State Recommendation

The 1973 Wyoming Environmental Quality Act provides for regulation of solid waste disposal. Therefore, this problem should largely be eliminated.

Comments

Land Quality Division, Environmental Quality Department

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In Volume II, Chapter VI, "Significant Mitigating Measures" as well as in other areas of the Environmental Impact Statement, there appears to be almost total disregard for the provisions of Article 4, Land Quality, of the 1973 Wyoming Environmental Quality Act.

State Recommendation

With respect to mine land reclamation and the impacts to be experienced regarding all aspects of the proposed mining operations, the provisions of Article 4, Land Quality, of the 1973 Wyoming Environmental Quality Act, present as much a significant mitigating measure as any of the provisions presented concerning federal control. It is felt that more consideration should be given to the provisions of Article 4 in minimizing the immediate impacts of the mining operations on the topography, soils, mineral resources, water resources, vegetation, archaeological, paleontological and historical values and aesthetics. It is also felt that perhaps some space should have been provided for elaboration on possible avenues of state-federal co-operation in controlling mine land reclamation and eliminating or minimizing the impacts described.

Comments

Department of Environmental Quality, Division of Water Quality

Under the heading of Domestic and Construction Wastes there appears to be an attempt to describe sewage systems and waste water treatment. The material is not very informative, does not stress requirements or controls to be expected.

State Recommendation

Domestic and construction wastes include sanitary wastes from construction and operating employees, debris from packaging and used construction material.

With both State and Federal laws covering the treatment and discharge of sewage and other wastes, a high degree of treatment will be required in all cases. Domestic sewage must be treated to secondary treatment standards and industrial wastes must have best practical treatment as defined by the Environmental Protection Agency. If such treatment is not adequate to maintain the state water quality standards in a receiving stream, a higher degree of treatment will be provided.

While stabilization ponds and aerated lagoons have been widely used in this area in the past, their future use should be considered only for installations where complete containment can be accomplished or the effluent recycled to land application or industrial use.

Any installation considering a discharge to surface discharge to surface drainage should consider some variation of the activated sludge process to be sure of meeting the requirements for secondary treatment. The activated sludge process can be adapted to a wide range of population, from the single residence to multi-million gallon a day plants. Many package plants, suitable for small communities and industries, are available on the equipment market. Any surface discharge will require a permit to discharge.

The treatment system proposed for the Wyodak Power Plant and the permanent community will be a package plant using a variation of the activated sludge process known as extended aeration. This consists of 24-hour aeration of the sewage and final settling to remove the biological floc. Provisions are made for returning the sludge to the process and holding of any excess sludge. This plant will be approximately 3500-gallon capacity and will handle

the community of 50 to 60 people involved in the operation of the plant.

Since onsite temporary housing will be provided for construction workers, it is proposed to handle these wastes with an aerated lagoon system.

Solid wastes from construction sites involve both combustible and non-combustible materials. Flammable material may be burned to reduce bulk either in approved incinerators or by open burning in remote sites provided authorization has been obtained.

Comments

Department of Environmental Quality, Division of Water Quality

Under the heading, Monitoring Programs no mention is made of the monitoring network for surface waters.

State Recommendation

Add the following paragraph on page I-618: There is a total of fourteen monitoring stations for the control of surface water quality in the area. Seven of these stations are long term trend stations operated by United States Geological Survey through contract with the Department of Environmental Quality and seven stations are problem oriented stations operated by the Department of Environmental Quality staff.

Comments

Department of Environmental Quality, Division of Water Quality

This paragraph indicates no control of the discharges.

State Recommendation

Add the following sentence: However, the degradation should be minimal considering the State and Federal controls placed upon such discharges.

Volume II, Chapter V page I-499 Paragraph 2 Last Sentence

Comments

Department of Environmental Quality, Division of Water Quality

The formation of acid waters from coal mining is not normally associated with the ph of the natural waters.

State Recommendation

Acid waters from coal mining are not expected because of the small amount of pyrites and other sulphide ore found in conjunction with the coal. Also, the low precipitation in the area prevents leaching of these materials.

Comments

Department of Environmental Quality, Division of Air Quality

Some of the data contained in Table 7 as given is not accurate.

State Recommendation

Substitute the attached Table 7 for the given Table 7.

Power Plant Emissions in the Study Area

<u>Stack</u>	<u>Particulates</u>	<u>State Allowed*</u>	<u>Federal Allowed**</u>
1	1317 lb/hr	285 lb/hr	105.4 lb/hr
2	1330 lb/hr	285 lb/hr	105.4 lb/hr
3	1722 lb/hr	532 lb/hr	221.5 lb/hr
4	20.4 lb/hr	821 lb/hr	359 lb/hr

<u>Stack</u>	<u>SO₂</u>	<u>State Allowed</u>	<u>Federal Allowed**</u>
1	1368 lb/hr	---	1265 lb/hr
2	1381 lb/hr	---	1265 lb/hr
3	1788 lb/hr	---	2658 lb/hr
4	1085 lb/hr	---	4294 lb/hr

<u>Stack</u>	<u>NO_x</u>	<u>State Allowed</u>	<u>Federal Allowed**</u>
1	1065 lb/hr	---	738 lb/hr
2	1073 lb/hr	---	738 lb/hr
3	1391 lb/hr	---	1551 lb/hr
4	1430 lb/hr	---	2505 lb/hr

*State limits for Existing Facilities.

**Federal limits for New Facilities.

Neil Simpson Station Emissions

<u>Stack</u>	<u>Particulates</u>	<u>NO_x</u>	<u>SO₂</u>	<u>State*</u>	<u>Federal**</u>
1	69 #/hr			31.9 #/hr	
2	6.9 #/hr			22.0 #/hr	
3	57 #/hr			22.0 #/hr	
4	163 #/hr			98.0 #/hr	28.8 #/hr
4		176.8 #/hr			201.6 #/hr
4			138.0 #/hr		375.6 #/hr

*State limits for Existing Facilities.

**Federal limits for New Facilities.

Comments

Department of Environmental Quality, Division of Air Quality

Paragraphs 2, 3, 4, and 5 on this page discuss emissions from point sources in the context of uncontrolled emissions. All existing sources in the state will complete control programs before the Fall of 1977, and all new sources will be required to incorporate controls during the construction of the source. Therefore, "uncontrolled emissions" is misleading information.

State Recommendation

The "uncontrolled emissions" data should be replaced with data representing the level of control required by the State of Wyoming.

Comments

Department of Environmental Quality, Division of Air Quality

The last sentence of the second paragraph alludes to serious air quality impacts at Gillette and Douglas, but no definitive information is presented as to the predicted level of air quality impact.

State Recommendation

Air quality dispersion models should be employed to define a predicted level of air quality degradation due to the proposed point sources of emission.

Comments

Department of Environmental Quality, Division of Air Quality

Table 1 contains emission information relative to existing and new sources which does not accurately reflect the actual emissions or the emissions which will be allowed under the regulations.

State Recommendation

Replace Table 1 with the attached Table 1.

Table 1

Some Potential Cumulative Emissions Impacting the Region

Plant Facilities	Emissions by Year - 1,000 tons per year									
	1980				1985				1990	
	P	SO ₂	NO _x	CO	P	SO ₂	NO _x	CO	P	SO ₂ NO _x CO
Dave Johnston Power Plant (750 MW)*	8.4	19.5	19.3		8.4	19.5	19.3		8.4	19.5 19.3
Wyodak Power Plant (New 330 MW)**	1.5	14.3	10.6		1.5	14.3	10.6		1.5	14.3 10.6
Wyodak Power Plant (New 450 MW)**					2.1	19.0	14.5		2.1	19.0 14.5
First New 500 MW Power Plant**					2.3	21.4	16.1		2.3	21.4 16.1
Second New 500 MW Power Plant**									2.3	21.4 16.1
Second Gasification Plant***					2.1	23.8	11.4	6,000	2.1	23.8 11.4 6,000
Panhandle Eastern Gasification Plant***	2.1	23.8	11.4	6,000	2.1	23.8	11.4	6,000	2.1	23.8 11.4 6,000
Cumulative Totals	12.0	57.6	41.3	6,000	18.4	121.8	83.3	12,000	20.7	143.2 99.4 12,000

*Existing Plant with emission controls.

**New sources will have controls in accordance with Wyoming Air Quality Standards and Regulations.

***Includes companion power plant.

P - Particulates.
 SO₂ - Sulfur dioxide.
 NO_x - Nitrogen oxides.
 CO - Carbon monoxide.

Comments

Department of Environmental Quality, Division of Air Quality

The third paragraph discusses damage to plants resulting from SO₂ and cites such plant damage in California for comparison. In order to assess the possibility of such damage, a comparison of ambient SO₂ concentration is needed.

State Recommendation

A comparison of data should be presented that indicates SO₂ concentration at which the damage occurred in California and that indicates the predicted levels of SO₂ concentration due to development in the Powder River Basin.

Comments

37

Department of Environmental Quality, Division of Air Quality

Table 1 as presented does not accurately reflect the levels of control which will be required on new sources.

In addition, the column labeled "Carbon Dioxide" should be labeled "Carbon Monoxide."

State Recommendation

Replace Table 1 with the attached Table 1.

Table 1

37

Total Unavoidable Stack Emissions
(tons/year)

<u>Year</u>	<u>Particulates*</u>	<u>Sulfur Dioxide**</u>	<u>Nitrogen Oxides***</u>	<u>Carbon Monoxide</u>
1980	12,000	34,560	24,800	6,000,000
1985	18,400	73,100	50,000	12,000,000
1990	20,700	85,900	59,600	12,000,000

*Assumes 99 percent emission controls for new power plants.

**Assumes 40 percent removal in furnaces of power plants.

***Assumed 40 percent removal within boilers of power plants.

Comments

Department of Environmental Quality, Division of Air Quality

Table 2 gives total emissions for the Casper and Wyoming intrastate regions and the predicted increases of those emissions.

Since these regions contain all but four counties in the State of Wyoming, the data presented is misleading.

In addition, the predicted increases do not reflect emissions using the level of control required by the state.

State Recommendation

The increases on the attached Table 2 should be substituted for the original data and the "1970 Total" should be revised to include only those 1970 emissions in the study area.

Table 2

Total Emission Summary for Casper and Wyoming Intrastate Regions
(tons/year)

Type	1970	1980		1985		1990	
	Total	Total	Increase**	Total	Increase**	Total	Increase**
Particulates	120,649	132,900	10%	139,400	16%	141,800	18%
Sulfur Dioxide	63,389	98,555	55%	137,400	117%	150,500	137%
Nitrogen Oxides	93,264	122,000	31%	149,000	60%	160,500	72%
Carbon Monoxide	323,614	6,323,614	185%	12,323,614	371%	12,323,614	371%

*Combined total for Casper and Wyoming Intrastate Air Quality Control Region adapted from Wyoming Air Quality Standards and Regulations, 1973.

**Percent increase over base year (1970), includes stack and train emissions.

Comments

Division of Plant Science University of Wyoming

"There will be a 50% loss in productivity for grazing purposes. This will occur even if the entire area is revegetated."

"It is doubtful that full production can ever be restored to areas disrupted by strip mining. The assumption has been made that even upon revegetation, productive capacity will be reduced to 50 percent of previous capacity."

Statement

Research on grazing productivity of revegetated lands in comparison to native rangelands at the Gillette Agriculture Experiment Station has shown that the revegetated lands produce approximately two and one-half as much beef per acre as compared to the native range. Published research data obtained from grazing experiments on a 120 acre revegetated tract during seven years of study show an increase in steer weight per acre of 146 percent from the seeded tract as compared to the native range (data from 1954, 1955 and 1956.) Similar increases were obtained on the same tract in later years when grazed by cows and calves. Average cow and calf weights per acre during the 1959, 1960, 1961 and 1962 grazing season increased 139 percent on the seeded area as compared to the native range productivity. These data are available in two publications. (1) "Cattle-grazing Study of a Combination of Seeded Pastures Versus Native Range." Wyo. Agr. Exp. Sta. Mimeo. Circ. No. 82, by R. L. Lang and Leland Landers. 1957; and (2) "Cow-Calf Production on Seeded and Native Range." Wyo. Agr. Exp. Sta. Bul. No. 472, by Ned Jefferies, R. L. Lang, Morton May and Leland Landers. 1967.

As these data were obtained from the Gillette area, and on tracts larger than any yearly disturbance expected from an individual mining activity, and are based on technology that has not decreased since the time the tracts were seeded, it is presented as the best available data. Unless these data can be refuted, or unless better actual data are available, these data showing an increase in productivity for grazing purposes should be used in the draft replacing assumed reductions of 50 percent.

Comments

Division of Plant Science University of Wyoming

"This will result in the destruction and mixing of the topsoil on approximately 14,000 acres by 1990. This will destroy all of the soil characteristics, micro-organisms and climatic relationships which have been established over a long geologic time span."

Statement

The statement as given simply is not true. Mixing of the topsoil, which in the eastern Powder River Basin is primarily without distinct horizons (azonal), will not destroy all of the soil characteristics, will not destroy all of the micro-organisms and will not destroy all of the climatic relationships, although it is not clear in the draft what the climatic relationships actually mean.

Comments

Division of Plant Science University of Wyoming

"No satisfactory evidence is presently available which would suggest that strip mined areas can be satisfactorily revegetated with plant communities that will satisfy needs of deer and antelope."

Statement

To my knowledge there is no publication or listing, available to myself or persons that have prepared the draft impact statement, that explains what plant community requirement would satisfy the needs of deer and antelope. Examples of strip mine reclamation to meet the habitat needs of fish and terrestrial game animals are numerous in publications on the subject of mine land reclamation. Before assumptions can be made on the probability of revegetating to satisfy the needs of deer and antelope the "needs" must be clearly stated. Once the needs have been defined they can be met with properly planned reclamation programs.

Comments

Division of Plant Science University of Wyoming

"Mining activity will disturb wildlife, affect some access to private land previously hunted and generally require residents of the area to travel 30 to 40 miles farther for hunting."

Statement

The referred to sentence in the draft is an overstatement that requires additional consideration. Mining activity can affect access to hunting, both positively and negatively. It should be noted that on reclaimed mined lands of Wyoming and other states that game animals are both frequent visitors as well as residents of these lands, and to generally require residents to travel 30 to 40 miles further for hunting means that there would generally be no hunting available in an area with a radius of 42.5 miles from Gillette (an area of approximately 5,675 square miles.)

COMMENTS OF THE
WYOMING GAME AND FISH DEPARTMENT
ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT
DEVELOPMENT OF COAL RESOURCES OF THE
EASTERN POWDER RIVER COAL BASIN
OF WYOMING

37

Personnel of the Game and Fish Department have reviewed the subject draft environmental impact statement. The following comments are offered in keeping with the spirit of the National Environmental Policy Act which requires lead agencies to review each project in a manner which objectively examines what it proposes to take from the resources of the area and what it will return for future generations and to examine all alternatives to the proposed project.

In keeping with the philosophy of NEPA, we have reviewed this draft environmental impact statement on the basis of the following criteria as they apply to the fish and wildlife resources and the management thereof:

1. Completeness of the statement.
2. Accuracy of information contained in the statement.
3. Accuracy of analysis of information presented in the statement.
4. Validity of conclusions based on information presented in the statement.

The purpose of the review is to apply the expertise of trained fish and wildlife management personnel to the impact analysis phase of the decision making process in order that trained persons familiar with specific situations can contribute to the store of information to be utilized by the decision makers.

The following specific comments are offered to assist in making the final environmental impact statement more complete and accurate in reference to the fish and wildlife resource:

Volume I

- I-59 A reclamation schedule should be shown for proper restoration to wildlife habitat similar to the schedule for livestock in number 6. Available information indicates that a rehabilitation schedule for wildlife habitat, either for terrestrial or aquatic wildlife, would require a longer term commitment including water rights.
- Those areas scheduled for planting as wildlife areas should be protected from livestock grazing. The amount of AUM's available should be determined on all reclaimed land before livestock grazing occurs. The number of acres to be reclaimed for wildlife should be pre-determined by mining companies in the planning and permitting process.
- I-323 The harvest information presented for deer for the
(Table) year 1972 in the Northeast Region is incorrect. An additional 8,252 non-resident hunters were projected to have harvested an additional 5,826 deer above that which was published in the annual harvest report. The majority of these hunters and deer were projected in the Gillette area and Weston County.
- I-324 The first paragraph should be changed to show that "Whitetail deer are found in good numbers along the Powder and Little Powder Rivers within the study area."
- "and increased illegal killing" should be added after "...loss of habitat."
- "and the area's population is now stablized." should be deleted from the second paragraph.
- I-326 "Although not a threatening factor, the red fox is an important predator on the sage grouse and other birds in the area." This sentence should be added after "Red fox numbers are increasing."
- I-331 It should be pointed out that the five to eight sage grouse per square mile is an average figure for the overall area. Certain specific areas contain a much higher density while others would be lower.

The statement that no specific information about sage grouse wintering areas is not true. Due to the uniformity of vegetation and topography of the Northern Great Plains much of the sage grouse range is considered year-round range, which would include winter range. Winter conditions in the study area are usually not so severe that the birds have specific wintering areas. There are no significant migrations.

In 1970, Bob Williams reported (Wyoming Game and Fish Department, Current Status and Inventory G3, 1970) the density of sharptail grouse in northern Campbell County to be approximately 7-10 males per square mile and approximately 4-6 males per square mile for central Campbell County. Assuming equal sex ratios, it would be acceptable to project sharptail population figures in amounts equal to 14-20 birds per square mile for the northern part of the county and 8-12 birds per square mile for the central part of the county.

- I-333 "Low moisture is the major habitat limiting factor." The above sentence should be added with reference to wild turkey.
- Figure 64 Wild turkey populations for that portion of Converse County within the study area is estimated at 300 birds. This information should be included with a population figure for Campbell County and inserted into the report in place of "unknown".
- I-339 (line 8) Change "7000" to "9000" acre Keyhole Res.
- I-341 (line 5) Add the following non-game fish: sturgeon chub (considered rare and endangered), River carpsucker, plains minnow, silvery minnow.
- (line 7) Change to read "Stonecats, black bullheads and channel catfish are present..."
- (line 19) Others include, etc., add "smallmouth bass" after green sunfish.
- (line 23) Add after green sunfish "and smallmouth bass".
- (line 26) Add "northern pike" to game fish list.
- I-342 (line 1) Should be "fathead minnow" rather than flathead minnow.
- (line 2) After "With the exception of walleye, rainbow trout..." add "northern pike and smallmouth bass."
- (line 5) Change "...with well over 7000 surface acres" to "with about 9000 surface acres."

(line 7) Gillette Fishing Lake - note that the deed was turned over to the City of Gillette on March 15, 1968. This transfer reserved water and area to recreation and fish and wildlife use subject to reversion for violation.

(line 13) Omit reference to brook trout introductions. i.e. "Occasionally brook trout are also introduced."

I-343 Little Powder River - We have not planted the headwaters of this stream since 1960. Other references to trout in this section of stream should be omitted.

I-347 The number of upland game hunters is low in that portion of Converse and Campbell Counties within the study area. The number is not low for all of northeastern Wyoming.

"Sharptail" should be added to the list of upland birds in the fourth paragraph.

Volume II

I-518 The statement "complete loss of 300 head of elk" should be clarified. We anticipate the loss of 90 Rochelle Hills' elk but with proper protection and planning to prevent human disturbance, the Fortification elk can survive as a huntable population. If land use planning and management programs do not consider the requirements of the Fortification elk herd, they will most likely be lost. This loss, if projected on the basis of 25% harvest for the period of 20 to 50 years, would amount to 1,700 to 4,250 for both areas or 500 to 1,050 for the Rochelle Hills' herd and 1,200 to 3,200 for the Fortification elk herd.

I-521 The last paragraph which continues on to page I-523 indicates a one-shot attempt at reclamation. This should not be allowed. In the future, no mining should be permitted until a satisfactory reclamation plan can be prepared and feasibility shown. There is a need for research to learn how to reclaim areas in Campbell County with species which are beneficial to wildlife. A positive recommendation should stress research on establishing sagebrush, rabbitbrush, skunkbush, Sumac, sagewort, chokecherry and juniper as they are beneficial and/or required by big game.

I-526 "An estimated 500 - 1,000 miles of fence will be constructed..." Game and Fish personnel should be involved in deciding if we want game to pass or be excluded. Perhaps the main right-of-way should exclude antelope and the

spurs should allow passage. Maximum 40" high barbed wire, 12-14" bottom wire design would allow passage.

- I-530 The loss of 850 mule deer from the base population could result in a loss of productivity varying from 9,000 to 20,000 animals in the estimated 20 to 50 year loss of deer habitat.
- I-531 We can see little future for the Rochelle Hills' elk but have more hope for the Fortification herd if human activity is minimized. (See our comments on I-518.)
- The loss of 2,700 antelope from the base population could result in a loss of productivity varying from 30,000 to 80,000 animals in the estimated 20 to 50 year loss of antelope habitat.
- The loss of 1,200 sage grouse from the base population could result in a loss of productivity varying from 48,000 to 120,000 birds in the estimated 20 to 50 year loss of habitat.
- I-532 In the second paragraph, it should be noted that large storage reservoirs may benefit cold water species as well as warm water.
- I-534 "Predation from domestic pets" should be added to causes for increased mortalities of wildlife after "...collisions with autos..." in the top line.
- I-688 It is noted in the section on "Alternative Reclamation Objectives for Wildlife Habitat":

"Many wildlife species prefer areas with rough or significant relief containing lakes and reservoirs. Wildlife will also use areas having other types of topography with gentler relief."

This section does not, however, account for the need to maintain some of the abrupt topography relief conditions as exist in many of the outcrops that furnish essential cover for wildlife and for domestic livestock during severe storm conditions that are frequent in the Powder River Basin.

I-863

There are 90 elk in the Rochelle Hills in the vicinity of the Arco-Kerr-McGee leases, not 300. There are approximately 230 in the Fortification area. (See our comments on I-518)

Volume III

Comment:

Planning of public roads to allow access to presently unaccessable public land could help distribute hunters and make more game available to hunt.

State land should be available to public for recreational purposes that do not destroy grass, hunting, hiking, etc. - most everything expect indiscriminate vehicular use off roads.

II-107

Railroad to destroy or adversely effect 3,900 acres and result in an estimated loss of 75 antelope. This 75 seems too low. We would estimate 150 antelope displaced and lost. We will also lose production of those antelope for X number of years.

Comment:

The western alternate appears to be the least detrimental to wildlife. It is parallel to WY 59. (See "Advantages of Western R.R. Alternative Over Proposed Route" under Discussion of Railroads.

II-107

The loss of 10-20 deer is too low. We estimate a loss of 40 deer.

II-108

If BN fence standards illustrated are used, the right-of-way fences most definitely will be a barrier to antelope and will cause loss during severe storms.

The impact upon habitat will not be as great if the western alternate route is followed and problems due to storms can more easily be detected before losses occur if the RR parallels the highway. (See "Advantages of Western R.R. Alternative Over Proposed Route" under Discussion of Railroads.

Comment or emphasis should be made that there will be a switch from a 75-25 ratio of non-resident to resident to 75-25 resident to non-resident for available hunting licenses. Those business, including guides and outfitters services, will have to adjust to this change and residents presently are not willing to pay for hunting privileges.

The western alternative will remove less huntable habitat if it parallels the highway. It also could be planned so as not to reduce recreational access routes and areas.

VII-615

The railroads western alternative rating is equal to or lower than the proposed route in its adverse effects upon wildlife (Table in EIS report).

The western alternate would have less effect upon ranches and livestock grazing and wildlife use as it would be located in an already disturbed corridor.

- II-114 A severe impact of the construction of the railroad on big game species will be isolation of considerable range from permanent sources of water. The impact statement states that 9,530 acres of range will be severed from its water source. If this is unavoidable, new sources of water should be developed and maintained by the railroad in such areas as part of their right-of-way permit. The need for planning can be witnessed in road design that tends to accumulate water in borrow ditches that are fenced off from use while stock ponds are drying up.
- II-115 The above statement also holds true for the four water wells and one stock reservoir which will be destroyed by the railroad. This impact is mentioned in the section of impacts on livestock grazing but is more applicable to big game animals than livestock.
- The railroad right-of-way fence will present a significant barrier to big game animals, especially antelope. If adequate water is provided and other needs are met in the areas adjacent to the right-of-way, the effect of the fences will probably be less than if collisions with trains were allowed to occur.
- II-120 Allowance should be given to lessening the isolation of public lands to public access by the right-of-way by providing ample crossings. Table 2 lists the proposed railroad crossings. One more crossing must be required in Converse County in addition to those listed. This is on the road west of Wyoming Highway 59 which is a westward continuation of the Dull Center road. The railroad will cross the road in approximately Section 15, Township 38N, Range 70 W. Although the road is not a designated county road, it lies entirely on public lands administered by the U.S. Forest Service and provides access to approximately 20 sections of public land in one block.

Discussion of Burlington Northern-Chicago North Western Railroad

The construction of this railroad or the alternate routes will have little or no adverse effect on fish or fishing although the report mentions the possibility exists. Perhaps they refer to siltation and

Pollution of streams during construction and to herbicidal treatment of vegetation in the right-of-way which may gain access to waters. The railroad route crosses generally intermittent streams of little fishery value. Some care should be exercised during construction of crossings and vegetative spraying.

If topography, drainage areas and access are suitable, some thought might be given to using the railroad fill as a dam to create fishing ponds. The sites should impound water at least 15 to 20 feet deep with an area of 3 to 5 surface acres (or larger). The fill should be properly rip-rapped fitted with a tricle tube to handle excess runoff.

Whether such sites exist or if the railroad companies would even consider such a proposal is a matter of conjecture at this time.

Advantages of Western R.R. Alternative Over Proposed Route:

1. Western alternative would remove less wildlife habitat and hunting area.
2. Would be located in a less important area of antelope habitat. Deer of little importance in district.
3. The right-of-way fence excluding antelope would present a problem, particularly for antelope during storms, along both routes, but if the RR is along WY 59, a much closer check can be made of antelope build-ups and antelope let through if necessary.
4. Range fire control would be easier thus reducing habitat loss. WY 59 could serve as a fire barrier.
5. If the western alternative is followed, only one antelope barrier will exist with WY 59 rather than 2 - the proposed route and WY 59.
6. The area between the proposed route and WY 59 could become a problem area of restricted hunting due to the small space, thus removing antelope from the huntable population. Building-up may occur followed by private landowners requesting the removal of the antelope. Net result: loss of perhaps another 75 antelope from the base population.
7. Ranch lands would not be split up as much.
8. There would be fewer public access routes blocked if the RR paralleled WY 59. Any public road to WY 59 should cross the RR right-of-way also.

II-138 We would like to call attention to a discrepancy between the statement:

"It is recognized that along the majority of the proposed route legal flexibility to require specific types of habitat redevelopment does not exist."

and the statement contained on Page I-391:

"In summary, all of the respective jurisdictions (federal, state and counties) have sufficient authority to impose effective land and resource use controls. The real problem is the commitment of the appropriate governmental entity to exercise these authorities and responsibilities under the law."

This is in reference to rehabilitation for fish and wildlife along the proposed railroad route development and is an example of statements contained throughout the draft that indicate a need for additional legislation and regulations of conditions that will develop that cannot be controlled without additional authority.

Atlantic Richfield Co. - Black Thunder Mine

- III-13 The pond mentioned in Alternative 2 is Reno Reservoir #1 which contains largemouth bass, bluegills and bullheads. Apparently Reno Reservoir will be replaced with a 50 acre reservoir in 1982 (III-14).
- III-83 The mine location is approximately 10 miles SE of Highlight and it appears to be in the northern extreme of winter range. If so, this area's importance as winter range for antelope should be mentioned.
- III-117 Fencing of RR spur should allow for movement of antelope into and from winter range. Spur traffic should be slow and carry fewer trains than the main line, therefore, excluding antelope from right-of-way not as important. Movements will be primarily in spring and fall.
- III-138 Reno Reservoir is listed as 100 acres, however, we have it listed as 57 acres. When they replace it, it should be replaced at 100 surface acres rather than 50.
- III-139 The recommendation on this page is a good one. In addition to this, any related strip mine ponds should be developed if possible.

III-138 The primary wildlife cover is the topography and big sagebrush. Present knowledge has not shown how this can be improved upon, particularly for big game or game birds. It is also questioned if "improving vegetative species and composition" is practical at this time. Water development is recognized as a practical habitat improvement possibility but must consider the requirements of the wildlife species.

The proposed actions to mitigate the habitat loss are unrealistic and cannot succeed for big game or game birds. The habitat and associated wildlife will be lost if the actions proposed are accepted. Wildlife management people should be consulted.

More emphasis on reclamation with vegetation valuable to wildlife. Techniques have not yet been found to grow big sagebrush, rabbitbrush and winter fat but research should be done to find the answers and should be started now to evaluate success on a long term, not only on the first growing season.

III-140 A direct conflict is proposed as mitigation for wildlife and livestock grazing. If sagebrush is sprayed to "improve species composition for livestock grazing" wildlife habitat will be destroyed. If sagebrush habitat is encouraged, less livestock forage will be available. There may be a compromise, but both wildlife habitat and increased livestock grazing cannot be achieved as proposed by the report. (Also see III-138)

Volume IV

Carter Oil Co. - North Rawhide Mine

Rechanneling of Rawhide and Little Rawhide will have no effect on existing fisheries. Downstream erosion and sedimentation could affect Little Powder River which does not provide a good fishery although green sunfish and bullheads exist. About seven to ten miles of Little Powder River upstream from the Montana-Wyoming line contains channel catfish. Perhaps some sediment control should be employed such as settling pits, etc. Recommend pond development in the mined area for future fisheries. (See page IV-138 and 139) The close proximity of the mine to Little Powder River may provide the necessary water source for pond development.

IV-27 The reseeding of the North Rawhide mine with Nordan crested wheatgrass and Russian Wild Rye as suggested by Professor Lang would not supply suitable wildlife cover.

IV-74 The lease area is primarily within Antelope Management Area 17 - Gillette NOT 19 - Rozet as the report says.

- IV-77 Sport harvest is minimal on sage grouse but will increase greatly within a few years as the human population increases.
- IV-116 The following should be added: "Loss of winter antelope range would result in a loss of an additional 50-70 antelope bringing the total to 100 to 135 antelope." See projected loss based on 20-50 year disturbance of habitat in our comments on page I-531.

Kerr-McGee Coal Corporation - Jacobs Ranch Mine

There will be no effect on the fisheries as none exists.

- V-81 The following should be added: "35 antelope on lease area year-round but numbers increase to 60-80 during the winter. The lease is located in the northern portion of a major antelope wintering area."
- V-115 The following should be added: "Loss of winter range would eliminate an additional 30 to 40 antelope for a total of 65 to 75 antelope lost."
- V-134 The same mitigations are listed for the Jacobs Mine as were listed for the Arco Mine (III-138 and 140). The proposed habitat improvements are unrealistic with the exception of water development. Proposals to mitigate livestock grazing losses and wildlife habitat losses are also in direct conflict (See note page III-138).
- V-142 It is stated that if the pit is left as a pond, evaporation would not allow for other uses (agriculture, stream habitat). As present stream habitat is essentially non-existent, the water might be better utilized in a pond situation. If any water is available, which it may not be, perhaps smaller ponds could be developed rather than the entire mined area.
- V-146 Loss of 65 to 76 antelope including the year-round population and wintering antelope. (See our comments on projected loss based on 20-50 year loss of habitat page I-531).

Wyodak Coal and Mfg. Co. - North and South Pit Mines

The effect of this operation on fisheries in the immediate area is of no consequence as none exists now, however, some siltation may affect lower Donkey Creek which is a tributary to the Belle Fourche River and Keyhole Reservoir. Sediment control is suggested, however, Donkey Creek and the Belle Fourche are quite turbid during times of runoff or heavy rain.

The water supply of Donkey Creek may diminish with the construction of the new power plant. Wyodak has secured the City of Gillette effluent and will probably pipe it to the plant thereby reducing flows in Donkey Creek. This could possibly reduce groundwater supplies making available water for creation of a fishing lake more difficult though not impossible. Efforts to create a fishing lake or lakes should be maintained. Apparently some ground water is available as is water from other sources, possibly wells.

Wyodak Mine

Not an important area for big game because of limited habitat and existing mine.

VI-106

As yet there has been no long-term success at establishing big sagebrush, rabbitbrush, skunkbush, sumac, chokecherry or juniper on surface mine spoils in areas similar to Campbell Co. Research should be directed toward methods of establishing the species for wildlife. The Univ. of Wyoming would be the logical leader of reclamation research.

Volume V - Appendices

Map 9

The color legend showing antelope winter concentration areas in the EIS is turned around. The Light blue areas should be those areas known as winter concentrations. The dark blue areas should be other important areas.

C-65

Smallmouth bass and northern pike should be added to the list of fish.

Map 10

That portion marked lightly in red along the east side should be light green. That portion marked in red along the Belle Fourche River should have been dark green.

Antelope

Corrections and additions were made to the map following the existing key but the key is backwards. The light blue is W/Y range, the dark blue is U. Therefore, the blues are reversed.

General Comments:

The following are our suggestions covering the EIS report and concerning energy development within the Powder River Basin:

It is our opinion that the range/wildlife committee did an outstanding job reporting on the effects of coal development on the fish and wildlife resources within the study area.

No recommendations, alternatives or assurances are given in the report on how wildlife will be compensated for in loss of habitat.

No recommendations, alternatives or assurances are given in the report on what percentage of reclaimed land, if any, will be done to benefit wildlife rather than domestic livestock.

Not enough information is presented or apparently known concerning SO₂ residue from gasification plants and its effects on ponderosa pine. According to the report, all of the Black Hills, Rochelle Hills, Hat Creek Breaks, Shawnee Hills and Rawhide Buttes are within the fallout range of the proposed gasification plants. Loss of the ponderosa pine habitat within these areas would have drastic effects on whitetail deer and wild turkey populations.

The Department recommends that a separate EIS be prepared for each of the five proposed developments.

The contents of the EIS for the Eastern Powder River Basin should be combined with similar reports covering proposed and possible development in Johnson, Sheridan, Weston, Crook and Niobrara Counties in order to obtain an overall view of energy development in Northeastern Wyoming.

To make any detailed recommendations at this time is difficult without knowing all the various facets involved in the mining operations. In order to "get down to brass tacks" and learn the various details of each operation, we should meet with representatives of each company and determine if fishing lakes can or cannot be created as related to groundwater, runoff, wells, etc. and make recommendations from this point. If fishing lakes are not practical, then some land reclamation should be suggested and the area turned back to grazing, wildlife, etc.

Perhaps if fishing lakes are feasible, then smaller ponds or a series of smaller ponds should be developed as mining proceeds rather than to wait until completion for a large reservoir. This could provide a fishery in the general mining areas while the population is there to enjoy this type of recreation.

More emphasis is needed on loss of hunting. No mention is found of quality of hunting, more hunters in the field, competition for places to hunt, reduction in available antelope permits, eventual deer permits if hunter success is to remain high.

Our Department's problems are basically 2-fold: development and associated activity reduces game numbers. Development increases the human population thus

increasing the demand for hunting. Emphasis should be placed on the need for added personnel to meet demands of Federal Agencies, private inventory requests and research. Although tables appear throughout the report on the necessary growth of local city police departments and sheriff departments in and around the area, only slight mention is made in C-54 of the necessity of increasing the number of game wardens which will be needed to enforce the game and fish laws or of the management personnel to more intensively manage the fish and wildlife resources. The enforcement of game and fish laws will be especially critical during the construction phase of development due to the transient nature of construction workers.

No reference was made of the economic impact of the proposed development on the Game and Fish Department. At the present, the majority of antelope licenses sold for the management areas in the Powder River Basin are sold to non-resident hunters. The population increase forecast within the area will necessitate a reversal of this situation which will be detrimental to the economy of the Game and Fish Department. The same thing will occur in the whitetail deer management areas of the Black Hills.

A critical impact on all wildlife mentioned in the fish and wildlife sections will be posed on the mine sites by water table lowering on seeps and springs surrounding each of the mine sites. With pollution of the streams adjacent to the mines that can occur, drying up seeps and springs in this large an area will, in effect, de-water appreciable acreages surrounding each mine site.

Revegetation efforts on reclaimed lands should be geared towards a shrub-grass-forb community for wildlife habitat as well as for livestock grazing. Since wildlife will be influenced by the overall development, all methods possible should be used to lessen the impact upon wildlife species. From the

review of the impacts accounted for in this statement, it is apparent that fulfillment of our responsibility of the management of the fish and wildlife resources dictates that we support the general alternative to "restrict development" as described on Pages I-672 through I-678 in further support of this view. The Department is opposed to the construction of coal gasification plants in the Powder River Basin where insufficient information and detailed evaluation is available concerning the possible affects of such construction on large acreages of habitat and the wildlife resource in general.

In summary, our evaluation of the total statement by application of all four of the listed criteria (completeness of statement, accuracy of information, accuracy of analysis and validity of conclusions) must indicate the limitation imposed by the time frame allowed for the agencies to develop this draft. The limitation is apparent in comparing the portion of the statement dealing with regional analysis contained in Volumes I and II with site analysis contained in Volumes III and IV. Regional information is more complete and accurate primarily because of the availability of the information compiled by the Northern Great Plains Resource program. Site specific information was indicated as lacking in the subwork group reports of the Northern Great Plains Resource program and is also noted in the draft EIS. One primary need for additional information noted in the regional analysis is in the area covering the impacts on possible sources of water. The lack of information in the site analysis is noted in our detailed comments and is of such magnitude as to cause concern. Our primary concern is that development be planned to minimize adverse impacts on wildlife and that unavoidable losses be compensated to the fullest extent possible.

We do not believe that the five site specific analysis are adequate to achieve this end. Specifically, we believe the Final Environmental Impact Statement should include the following site specific information:

1. A comprehensive survey of the seasonal abundance, distribution and movement of wildlife. This information should be correlated with vegetative, hydrographic and topographic surveys of the site and attendant sphere of influence.
2. A quantitative analysis of the probably detrimental impacts on each wildlife species resulting from the proposed development.
3. A detailed description of the proposed program to mitigate and/or compensate for projected wildlife losses. Any proposals for public access for utilization, management, and enjoyment of wildlife should be included.

We are aware that the information we requested was not available to the Task Force which prepared the Draft Environmental Impact Statement. Until such information is available, however, an accurate assessment of unavoidable impacts on wildlife and the adequacy and feasibility of proposed mitigations cannot be made. We believe that it is the responsibility of corporations proposing development to supply the necessary information and that until it is available for public review the intent of the National Environmental Policy Act has not been met.

We believe that the Draft in its present form provides an excellent base from which to develop a cumulative resource and impact inventory. We commend the Bureau of Land Management and cooperating federal agencies for a monumental effort in its preparation. It is our strong recommendation, however, that separate Environmental Impact Statements be prepared for each of the five proposed developments as the necessary information becomes available and that until that time no further federal action is taken.

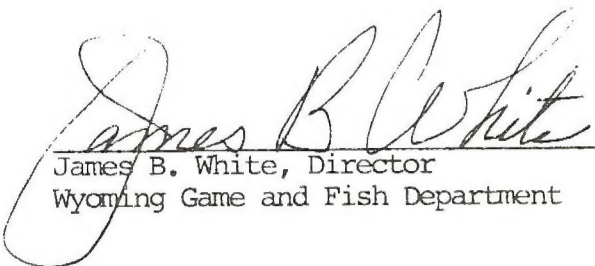
The overall effects or impacts of the proposed program as described in the analysis made and conclusions reached in this EIS indicates a need for additional state or federal legislation and regulation such as for plant siting legislation, stream preservation legislation and land use planning legislation.

Based on the information presented in these documents as corrected through testimony provided in the public hearings, the Wyoming Game and Fish Department would be remiss in its delegated responsibility if it would not support the

alternative described under "Restrict Development" on pages I-672 through I-678.

Thank you for the opportunity to present our views.

Reviewed and presented this 2nd day of August, 1974.



James B. White, Director
Wyoming Game and Fish Department

CommentsThe Geological Survey of Wyoming

There is a condescending tone that pervades the report with regard to the State's role and responsibility in providing for (a) the welfare of its land and people, and (b) the State's authority to administer its laws and protective rules and regulations. This is in marked contrast to similar but more positive statements pertaining to the role, function, and authority of the federal agencies.

State Recommendation

That wherever applicable in the report the wording be altered to more properly reflect the State's role of responsibility and authority; and further to portray in a more discernible fashion the land management role provided by Wyoming's constitution, its laws, and its administration.

CommentsThe Geological Survey of Wyoming

While the linguistic style of this report is certainly acceptable, there are so many misconceptions and minor discrepancies in the technical aspects of what is said that it casts doubt on the credibility of the entire report. Time does not allow a complete review of all the discrepancies by this agency, but we do wish to call attention to a serious need for scientific and technical editorial review.

State Recommendation

That the technical parts of the report be reviewed by appropriate professionals in each of the fields of surface water, ground water, coal geology, coal mining, and transportation before the report is released to the general public.

Volume I, Chapter I page I 12

Comments

The Geological Survey of Wyoming

The first sentence under heading "State agencies" is an example of the condescending tone referred to in the general comments.

State Recommendation

Reword the sentence as - State agencies maintain control over most of the development described in this statement.

Volume I, Chapter I page I 18

Comments

The Geological Survey of Wyoming

In the tabulation of Campbell and Converse County acreage, the total acreage for each differs significantly from figures published in the Wyoming Data Handbook (1973).

State Recommendation

Recheck acreage figures. Your figures are 9,126 acres high on Campbell County and 87,836 acres high on Converse County.

Volume I, Chapter I page I 22

Comments

The Geological Survey of Wyoming

In the second paragraph, first sentence, - the word "opencast" tends to confuse the reader. What does it mean?

State Recommendation

Reword sentence to state - The immense are amendable to mining by both surface and underground methods.

Comments

The Geological Survey of Wyoming

In the second paragraph, second sentence, - Sentence has no meaning and needs to be qualified.

State Recommendation

Reword the sentence with qualifiers to indicate what - - ". . . sufficient to satisfy future demand" really means?

Comments

The Geological Survey of Wyoming

The pie diagram indicates that Wyoming has 31% of the strippable coal in the nation. More recent publications by the Bureau would show a lower figure.

State Recommendation

See more recent U.S. Bureau of Mines estimates published in 1973 and correct the spelling of "Liginite" to Lignite.

Comments

The Geological Survey of Wyoming

Figure 2 fails to show two coal mines and one electric generating plant north of Sheridan. The present map is misleading.

State Recommendation

If you do not mean to include data in the western half of the basin then don't show the map area. Otherwise, indicate all the data as the caption indicates.

Comments

The Geological Survey of Wyoming

In the first sentence at the top of page - "Originally, all coal mined" is not a true statement. The Best Coal Mine was developed for a domestic market, not the power plant.

State Recommendation

Reword the sentence to include the Best Coal Mine or just omit the sentence.

Comments

The Geological Survey of Wyoming

This agency favors construction of the proposed Gillette to Douglas railroad line as the most practical means of transporting coal out of the Powder River Basin. Furthermore, it favors a route parallel and immediately adjacent to State Highway 59 with sidings and spurs developed on mined out property wherever practical, and this would be our recommendation.

Comments

The Geological Survey of Wyoming

In the fourth paragraph reference is made to ground water use in oil field water floods which is inappropriate here. There is no reason to confuse the reader by combining figures related to irrigation, with ground water from the Fox Hills Sandstone taken at a depth of 3000 to 5000 ft. and reinjected into oil reservoirs at greater depths.

State Recommendation

It would be advisable to ~~separate~~ groundwater use into two separate paragraphs that clearly differentiate the near surface from the very deep flood operations.

Comments

The Geological Survey of Wyoming

The last paragraph of this section is poorly worded and gives the impression that there is and will be adequate groundwater for development and this is misleading to everyone.

State Recommendation

That this paragraph should be researched further in an effort to clarify "recharge" and aquifer distribution. The first two sentences should be reworded to more nearly represent the fact that near surface ground water has been and is in short supply if volume is to be considered.

Volume I, Chapter IV, page 428 Health and Social Services

Comments

Division of Health & Medical Services

The statements contained in this section refer to Health and Social Services as being a vital element in the consideration of the overall socio-economic environment. However, the summary sheet (i and i-1) in number 3. Summary of Environmental Impacts (by 1990) lists impacts from A through R and though omitting effects on people, includes changes to scenic views, soil structure disruption, live-stock forage reduction, etc.

The complete section on Health and Social Services provides only cursory and superficial information in spite of the fact that the survey report of the Denver Research Institute (page 1-456/1-458) on community attitudes reflects public opinion that improved medical facilities and more doctors as the fifth ranked concern of the ten most frequently mentioned. Nineteen percent of both mineral-related and ranching employment interests state a need for improved medical facilities and services.

Volume I, Chapter IV, page 1-429 & 1-430, Tables 60 & 61

Comments

Division of Health & Medical Services

These are 1972 figures and now could be changed to 1974 figures available in our 1974 Wyoming Health Profiles. This would require changing ratios of health manpower to population as described on page 1-431.

State Recommendation

The charts should be changed to reflect the current status of health manpower in the areas concerned, which would indicate a worsening of health manpower/population ratio.

Volume I, Chapter IV, page 1-433, paragraph 1

Comments

Division of Health & Medical Services

The utilization rate figures appear to be inaccurate. Acute rates are lower in this area due to the lack of manpower which has an effect on the services provided.

State Recommendation

The rate chart should be changed to reflect the correct rates. The number of beds is a poor indication of the services available to the residents of the area. One of the hospitals in the area is closed due to the lack of physicians. This should be indicated in the narrative.

Volume I, Chapter IV, page 1-433, paragraph 4

Comments

Division of Health & Medical Services

The section on services should detail additional health services covering ambulatory care, emergency medical services, preventive medicine, and environmental sanitation beyond water and sewer data.

State Recommendation

Include in this section obtainable data on above services from relevant state agencies or agency strategies for evaluating needs embraced within these service areas.

Comments

State Highway Department

The statement raises two major questions which we recognize as being extremely difficult to cope with at this time in an impact statement; but which by their nature are of major concern to us. These questions concern:

1. The effect that this development will have on agencies and all levels of government that are charged with providing and managing public services and their ability to finance them; and
2. The effect on our total statewide highway program that diversion of resources to the Powder River Basin will have.

With respect to item 1 the statement gives a clear picture of community needs as far as schools, water and sewer facilities, health and social services, housing, police and fire protection are concerned; but omits discussion of land use problems and transportation networks within the communities as well as the ability to finance public services. If public services are to be provided in harmony with population growth, planning must be done now so that programs can be formulated to provide these services and facilities in a manner that sets a pattern for orderly and desirable community growth. If the rate of community growth peaks in the 1980-1985 time frame as forecasted, then construction of facilities such as major arterial streets, schools, water and sewer systems must be started within the next two or three years.

With respect to item 2, we feel that transportation impacts are more far reaching than the confines of the Powder River Basin. Interstate 90 and Interstate 25 will need to be completed faster than presently envisioned. While the roads within the Powder River Basin are deficient in providing adequate levels of service for present conditions, improvements are not as urgently needed as they are in other parts of the State if the coal resources are not developed. Development of the coal resource within the short time period that is predicted increases dramatically the urgency that the roads that serve the Powder River Basin must be improved. We estimate that it will cost \$175 million to improve State highways that serve the Powder River Basin. This figure does not include costs of constructing streets within Powder River

Basin communities that might be included on the State or Federal-aid highway systems, nor does it include costs of upgrading highway-railroad crossings on the rail network that may be utilized.

The Highway Department is facing a "money squeeze". Total revenues have been relatively fixed over the past ten years and, without additional revenues, are expected to remain so. Maintenance and administrative costs are steadily increasing, with the net effect that money available for road construction will decrease. Trends indicate that, without additional revenue, our total statewide construction budget will decrease from approximately \$43 million for fiscal year 1975 to \$35 million in fiscal year 1980. Complicating the issue is steadily increasing construction costs which result in fewer miles of road improvement each year. We were able to reconstruct 57 miles of road on the Federal-aid Primary and Secondary Road Systems in 1973. These systems have a total statewide mileage of 5136 miles; and are the predominant road systems in the Powder River Basin. The combined effect of current revenue, spending, and construction cost trends is that only token improvements can be made within the next ten years to roads that serve the Powder River Basin.

State Recommendation

This presents a two phased problem: the rate of growth is so rapid that a "pay as you grow" program will not provide the services when they are needed resulting in an ever worsening situation; and the sheer magnitude of initial funding requirements is beyond agency and community abilities to provide. It would appear that the federal government is the only agency that can provide the initial financial resources required to begin implementing the wide ranging program of public facilities that are needed to provide the stability necessary for orderly growth. And if the federal government does provide impact area funds, guidelines and procedures for utilizing federal funds should be streamlined and tailored to fit an impact area situation.

We would suggest that the final statement address the financial impact on the various governmental bodies and agencies who are charged with providing and managing public services. This analysis should present alternative means of financing needed services and facilities within the timeframe of development.

The final statement should also address in a general way land use and transportation needs of the Powder River Basin communities and the associated impacts.

Comments

State Highway Department

Revegetation and reclamation steps are discussed in detail throughout the statement. We have had good results in establishing vegetation on highway projects in the Powder River Basin by following these steps:

1. Salvage topsoil and replace it over disturbed areas.
2. Seed and fertilize in accordance with recommendations of professionals in the field.
3. Mulch the seeded areas.
4. Water the seed bed until growth has been established.
5. Seed during the frost free season.

We have used crested wheat grass principally in the past. However, we are now using other grass seeds when recommended by agronomists.

State Recommendations

None needed.

Specific Comments

37

Volume II, Chapter XI, Pages I-880 to I-882

Comments

State Highway Department

We would echo points made by Mr. Westedt: that industrial development is on the scene; and the coal will be mined.

State Recommendation

Planning, funding, and controls must be directed now to providing an orderly and desirable pattern of growth.

Volume III, Part II, Chapter III, Page II-85, Line 21

Comments

State Highway Department

We do not agree that "Examination of offsite impacts is beyond the scope of this statement." We feel that the added rail traffic caused by development of the coal reserves will generate cumulative effects on the total rail network that will be utilized.

The impact statement did not give any rail traffic figures for any rail lines other than the Gillette-Douglas link. It would appear from the statement that all coal will be shipped east and south; however, it would seem that coal from Montana might also use the rail network in Wyoming and that competition might generate additional markets. We have reviewed the rail networks that might be used in Campbell, Converse, Crook, Goshen, Laramie, Niobrara, Platte, Sheridan, and Weston Counties. In addition to those identified on the Gillette-Douglas link in Volume III, pages II-25 to II-27 and II-119 to II-120, there are 306 at-grade crossings on this network, which includes State highways, county roads, local access roads, and city streets. Of these, 268 do not now have electronic warning devices. We feel that the warning devices on many of these crossings will have to be upgraded, and that it may be necessary to convert some to separated crossings.

We are particularly concerned about rail traffic in the communities of Lusk and Torrington where physical limitations prevent construction of separated crossings without disruption and/or displacement of a significant portion of the communities.

Twenty trains per day each way would block the crossings approximately 10 percent of the time, enough to completely disrupt orderly and efficient automobile travel patterns.

We plan to let a contract for construction of a separated crossing in Newcastle next year. However, a significant amount of rail traffic would reduce the usefulness of the four at-grade crossings in the community.

At Glendo the railroad lies between the community and the Interstate 25 interchange, thus blocking access to the interstate during periods of rail usage. A significant amount of rail traffic could generate the need for a new interchange as it is questionable whether or not a railroad separation structure could be built on the present access route.

Editorially, there is a discrepancy between Table 2, page II-26, and Table 2, page II-120. One lists 23 crossings and the other lists 24.

State Recommendation

The impact on the total rail network that will be utilized should be addressed, particularly in communities. In communities we feel that if railroad usage generates a need for separated road crossings that serious consideration be given to rerouting the railroad.

Volume III, Part II, Chapter III, pages II-119 to II-121

Comments

State Highway Department

A considerable portion of the Gillette-Douglas railroad is located in the close vicinity of State Highway 59, utilizing the concept that a single corridor will be utilized to accommodate both the railroad and the highway.

The concept of a transportation corridor to contain various transportation modes or facilities is certainly one which we endorse. The advantages of a shared corridor are obvious. Land severances are held to a minimum and land uses are not disturbed. In order to be effective, however, good land-use controls must be properly administered to protect and enhance the public investment in transportation. If not, a premature obsolescence or operational inefficiency of

the transportation system will take place.

The practicality of a shared corridor is not as self evident as the concept itself. The transportation modes being considered do not serve the same purpose. For example the railroad and pipeline systems convey raw materials between supply and refining termini; whereas, highways move people and goods between various termini. Utilities are similar to highways in that they are directly related to people needs. Highway corridors demand a much greater flexibility than either pipeline or railroad transportation corridors. If a combined corridor is to be successful then it must be located where sufficient right of way can be reserved to provide for future needs. In the past, attempts at combined corridors have failed because of limited right of way widths. Railroads were located close to utility lines and highways, and any expansion of any one of the three usually required major adjustments to the others. Other disadvantages are safety, animal crossing barriers, and maintenance problems associated with one facility that are either caused by the other facilities or cause problems on the other facilities.

One such problem is that of snow control on Highway 59 that is mentioned on page II-119.

State Recommendation

If snow control parameters are utilized as railroad design criteria, then the railroad will not create the predicted snow control problem. In many cases it might also alleviate existing problems. Similarly, if land use parameters are used as design criteria, flexibility for future expansion will be provided and both private and public investments in transportation will be protected.

Comments

Department of Labor & Statistics

In dealing with mitigating measures (Chapter IV), there is a glaring lack of coverage for current efforts underway to handle the socio-economic impacts projected for the Powder River Basin.

State Recommendations

It is recommended that the current effort by industry to construct a housing development in Gillette be included. Additionally there is a state effort to develop a non-profit development corporation to handle financing of housing in the impacted counties in the PRB. The feasibility of this proposal is under study, but it is an affirmative action which must be emphasized considering the generally negative atmosphere of the draft impact statement. Efforts are also underway to develop comprehensive legislation concerning housing and mobile home codes, a state housing authority, and development of a statistical program to compile a housing inventory on a statewide basis.

In general a more detailed treatment of current state efforts to explain, understand, and solve impact problems in the Powder River Basin would be appreciated which would afford a positive stimulus to the general public in its ability to comprehend all facets of the anticipated growth in the area.

Comments

We find this discussion on an alternative (staged development) quite distressing because of its brevity, lack of detail and once again its implicit negative atmosphere.

State Recommendations

The alternative of instituting time lags in construction of various industrial facilities in order to delay various impacts, especially those of social and economic significance, is appealing. If development of an action plan meeting this objective should become reality, and we believe it could with a little more coordination of federal and state efforts, the impacts, especially people impacts, would be diminished. This is not to imply that the total cumulative impacts on air, water, land, wildlife, transportation, housing, etc. will decrease, they will not. By spreading out construction of various facilities, it is felt this additional time will permit state and local governments to better handle the various impacts, especially those of a demographic nature. Housing, educational, and health care facilities could be constructed prior to the full population influx and thus local governments would be spared the perpetual catchup syndrome of a boom environment.

The need for Congressional approval to implement this alternative cannot be ignored but then with coordinated efforts of federal and state officials and their respective agencies, we feel this alternative is feasible and should not be dismissed lightly. It will require work and effort but if achieved the benefits will far outweigh the costs.

Comments
Wyoming Recreation Commission

A general statement covering all recreational, historical, and archaeological aspects of this entire study area should be set forth which specifies that all possible consideration will be given to the protection and development of known, discovered or developed recreational, historical and archaeological resources within the study area.

Comments

Wyoming Recreation Commission

Alcova Reservoir, Cook Lake and Antelope Butte Ski Area should be placed on this map.

Volume I, Chapter IV page I-357 last sentence

Comments

Wyoming Recreation Commission

This last sentence should read as follows: Keyhole, Glendo, Alcova and Guernsey Reservoirs offer good waterskiing when the water levels are kept to a compatible level. Probably the most significant problem affecting water base recreation is the Federal Government's apparent inability to significantly assist the State and County governments with the recreational administration and development of these Federally owned areas. A coexisting problem compounding this situation is the lack of minimum recreation pool levels at these locations. Water base recreation is sharply on the increase in these areas and without Federal assistance on these Federal lands, the State and County administrators may be forced to abandon these areas in favor of higher priority State and County owned areas.

Volume I, Chapter IV page I-358 Figure 72

Comments

Wyoming Recreation Commission

Cook Lake should be located on the above mentioned recreation map and also by explanation below the picture. If Cook Lake is not located within the study area the picture should not be used.

Volume I, Chapter IV page I-360 paragraph 1

Comments
Wyoming Recreation Commission

Antelope Butte Ski Area should be mentioned.

Volume II, Chapter V page I-539 paragraph 1

Comments
Wyoming Recreation Commission

The following two sentences should be added to the last of the above mentioned paragraph: This water loss problem is clearly illustrated by Keyhole Reservoir which is presently being administered as a State Park yet approximately ninety percent of the water is available for sale to South Dakota. If such a sale should take place and the water taken, the State Park would be destroyed and one of the major water base recreation facilities in the study area would be lost.

Volume III, Chapter IV page III-139 last paragraph

Comments
Wyoming Recreation Commission

The following sentence should be added to the end of the last paragraph: All new reservoirs including the new Reno Reservoir should be built with a minimum recreation pool, thus assuring potential recreational aspects of the development.

CommentsWyoming Recreation Commission

The following sentence should be added to the end of the first paragraph: All such water impoundment requests will be viewed in light of the desirability of establishing a minimum pool to enhance the recreation potential of the proposed development.

STATEMENTS RELATING TO THE DRAFT ENVIRONMENTAL IMPACT
STATEMENT ON DEVELOPMENT OF COAL RESOURCES IN
THE EASTERN POWDER RIVER BASIN IN WYOMING

37

Dr. Morton May
Division of Plant Science
University of Wyoming

Statement 1

(Reference) Vol. I, page 59, "There will be a 50% loss in productivity for grazing purposes. This will occur even if the entire area is revegetated." and (reference) Vol. IV, page 172, "It is doubtful that full production can ever be restored to areas disrupted by strip mining. The assumption has been made that even upon revegetation, productive capacity will be reduced to 50 percent of previous capacity."

(Statement) Research on grazing productivity of revegetated lands in comparison to native rangelands at the Gillette Agriculture Experiment Station has shown that the revegetated lands produce approximately two and one-half as much beef per acre as compared to the native range. Published research data obtained from grazing experiments on a 120 acre revegetated tract during seven years of study show an increase in steer weight per acre of 146 percent from the seeded tract as compared to the native range (data from 1954, 1955 and 1956.) Similar increases were obtained on the same tract in later years when grazed by cows and calves. Average cow and calf weights per acre during the 1959, 1960, 1961 and 1962 grazing season increased 139 percent on the seeded area as compared to the native range productivity. These data are available in two publications. (1) "Cattle-grazing Study of a Combination of Seeded Pastures Versus Native Range." Wyo. Agr. Exp. Sta. Mimeo. Circ. No. 82, by R. L. Lang and Leland Landers. 1957; and (2) "Cow-Calf Production

on Seeded and Native Range." Wyo. Agr. Exp. Sta. Bul. No. 472, by Ned Jefferies, R. L. Lang, Morton May and Leland Landers. 1967.

As these data were obtained from the Gillette area, and on tracts larger than any yearly disturbance expected from an individual mining activity, and are based on technology that has not decreased since the time the tracts were seeded, it is presented as the best available data. Unless these data can be refuted, or unless better actual data are available, these data showing an increase in productivity for grazing purposes should be used in the draft replacing assumed reductions of 50 percent.

Statement 2

(Reference) Vol. I, page 475, "This will result in the destruction and mixing of the topsoil on approximately 14,000 acres by 1990. This will destroy all of the soil characteristics, micro-organisms and climatic relationships which have been established over a long geologic time span."

(Statement) The statement as given simply is not true. Mixing of the topsoil, which in the eastern Powder River Basin is primarily without distinct horizons (azonal), will not destroy all of the soil characteristics, will not destroy all of the micro-organisms and will not destroy all of the climatic relationships, although it is not clear in the draft what the climatic relationships actually mean.

Statement 3

(Reference) Vol. IV, page 115, "No satisfactory evidence is presently available which would suggest that strip mined areas can be satisfactorily revegetated with plant communities that will satisfy needs of deer and antelope."

(Statement) To my knowledge there is no publication or listing,

available to myself or persons that have prepared the draft impact statement, that explains what plant community requirement would satisfy the needs of deer and antelope. Examples of strip mine reclamation to meet the habitat needs of fish and terrestrial game animals are numerous in publications on the subject of mine land reclamation. Before assumptions can be made on the probability of revegetating to satisfy the needs of deer and antelope the "needs" must be clearly stated. Once the needs have been defined they can be met with properly planned reclamation programs.

Statement 4

(Reference) Vol. IV, page 19, "Mining activity will disturb wildlife, affect some access to private land previously hunted and generally require residents of the area to travel 30 to 40 miles farther for hunting."

(Statement) The referred to sentence in the draft is an overstatement that requires additional consideration. Mining activity can affect access to hunting, both positively and negatively. It should be noted that on reclaimed mined lands of Wyoming and other states that game animals are both frequent visitors as well as residents of these lands, and to generally require residents to travel 30 to 40 miles further for hunting means that there would generally be no hunting available in an area with a radius of 42.5 miles from Gillette (an area of approximately 5,675 square miles.)


Morton May

COMMENTS ON
EASTERN POWDER RIVER COAL BASIN
DRAFT EIS

submitted for the "yoming Sierra
Club Group by Larry Edwards

Thank you for extending the deadline for comments to August 2; I would have been unable to comment in the original time frame. Even with the extension I was unable to go into the desired detail in my review and comments due to the bulk of the statement. I encourage you to allow the public much more time to review the final statement.

I certainly agree with the rationale behind this EIS as stated in the preface, "... the (four Federal) agencies have determined that to protect the public interests most effectively ... they should jointly undertake the preparation of a single environmental impact statement which would consider ... collective, cumulative impacts, primary & secondary, of the development of the coal resource in the area." I feel, though, that the EIS has fallen far short of this objective to consider "collective, cumulative" impacts. The EIS merely recognizes the fact that there will be such impacts; it generally does not present information on proposed or possible developments, the existing environment, or the impacts themselves adequate to assess the significance of collective impacts, either quantitatively or qualitatively. I fully realize that there are still many unknowns in industry plans, particularly for power and gasification plants, but certain assumptions, regarding emissions to the atmosphere for example,

can certainly be made with a fair degree of accuracy; and the ability, or at least the mechanisms, of the regional environment to resist cumulative impacts can be discussed.

As an example I will discuss air quality. Your section on present regional air quality covered, in a very general way, meteorological factors relating to inversions and pollutant dispersion, but completely neglected factors controlling "collective" air quality - namely, wind direction & velocity and mixing effectiveness under various conditions. This section on air quality and meteorology must be very detailed in space and time if we are to predict the synergetic effects of several industrial facilities on the region as a whole and on specific localities, such as Gillette, Douglas, and the Black Hills. I do understand that monitoring programs are just beginning, but it is unthinkable that you are seriously considering industrial proposals for clean air region and have reached the stage of a draft EIS without such information already in hand.

I contend that such information is vital, particularly in view of the statements (I-467), "Emissions could cause localized damage to vegetation and animals over a long period of time", and "Emissions could have injurious or toxic effects on humans working or living in the vicinity of power and gasification plants ... during periods of severe or repeated inversions. Throughout the basin there is a probability of 2 day inversions occurring 15 times per year, and a 5 day inversion occurring four times per year." Thus there is a probability that significant inversion conditions will occur 1/7 of the time, with a high frequency of occurrence during

the winter.

Those are very disturbing predictions, particularly since you:

1. did not present predictions for 1990 ambient air quality or for the ultimate development you would permit in the basin beyond 1990
2. made no attempt to quantify future emissions from urban areas and high ways
3. have not gone to the detail of estimating realistic emissions, based on available control technology, for power and gasification plants, and presumably have done likewise with other factors effecting air quality.
4. have not considered all factors, as mentioned before, effecting collective impacts on air quality

I think it is also important that in the final EIS you state how present air quality relates to primary & secondary standards and the court decisions preventing, where air quality is better than the standards, significant deterioration in any portion of any state. You should also state what effect, in your judgement, these standards and decisions will have on the predicted developments and potential total development in the area.

There are similar deficiencies in discussions of water quality and mined land reclamation; however, in these cases the condition of the environment seems fairly well known, and the problem with the EIS is that it does not apply information available by studying existing mining operations to estimate, for example, dissolved solids originating from spoil piles and amount of silt eroded from mined areas by the wind.

Your estimates of water supply available to Powder River Basin industry require a serious re-evaluation and revision. It was stated that 100,000 acre-feet/year are unappropriated in the Green River Basin. Actually, only about 30,000 acre feet can be used. The purchase of 60,000 acre feet of storage capacity at Fontenelle Res. from the Bureau of Reclamation by the state is currently pending, but information presented in a recent report by the Bureau of Sport Fisheries & Wildlife (Salt Lake City office) indicates that the sale and use of this amount of water would destroy the river fishery. Even if the sale is consumated, I am sure there will be a use for the water in the Green River Basin. Now I wonder how good your other water supply figures are.

I do not think you have given fair consideration to alternate energy sources, and I think you are required by law to give better consideration. Recall your statements, "Emissions could have injurious and toxic effects on humans ...", "With the semi-arid climate prevalent for the study area, sucessful revegetation on severely disturbed mined areas is unknown at this time." (I-655), and "The change of the study areas ~~area~~ from a quiet setting, with wide open spaces, basically uninhabited, to a basin busy with industry and human activity is unavoidable. The quiet solitude and natural peacefulness of the area will be changed." (I-658). Now read the National Environmental Policy Act, which I quote in part here:

Sec 101(a) The Congress, recognizing the profound impact of man's activity ... , particularly the profound influences of population growth, high density urbanization, industrial expansion, resource exploitation ..." (this indicates what was of concern to Congress in writing the Act)

Sec 101(b) ... it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may -

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health and safety, or other undesirable or unintended consequences;

Sec 102 ... all agencies of the Federal Government shall -

- B. identify and develop methods and procedures ... which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations;

If mine reclamation remains unsuccessful, as you state it is now, we will be neglecting our role as "trustee of the environment" if we mine the semi-arid west. Rather than assuring "productive, esthetically and culturally pleasing surroundings" and an environment free from risk to health and further degradation, we will rip the land without knowing if it can be fully repaired, allow injurious and toxic emissions, destroy the productive capability of the land to support livestock and wildlife, and destroy the esthetics of an entire region. You are required to insure the appropriate consideration of unquantified environmental amenities, yet have discussed them only in relation to coal developments, not any of the other energy alternatives. My determination is that you have only identified the amenities, but have not given them any consideration at all

in your decision pursue coal developement rather than one or several of the other alternatives. I do not believe that "essential considerations of national policy" require that coal be our major energy source.

I am particularly dissatisfied with your cursory approach to solar energy. Your main concern seems to be to use it in central power plants, but it is most suitable for installation on individual buildings for space and water heating. Its use will reduce electrical loads and obviate the need for at least some coal gasification plants. Developement of solar energy is far ahead of coal gasification. The two solar powered office buildings under construction (one by the Mass. Audubon Soc. is 8000 ft²) might be considered pilot projects, along with many solar powered homes across the country. According to Earth News the Australian government has fostered solar developement, and there are now 10,000 homes in that country using sunlight for hot water and heating. Larger units are being developed for factories and desalting plants. What is the current state of the art? How much less coal will the nation need if our government really pushes solar developement for 5 or 10 years? What will be the effect of recent solar energy legislation? What is the difference in impact between coal & solar? These are questions you must answer.

You must answer similar questions for energy conservation (and all the other alternatives). For example, what would be the technical, economic, and environmental considerations for piping waste heat from suitably located existing power plants to homes and factories for heating or other purposes?

In your discussion of alternatives you neglect the fact that

their applicability will increase in the same time frame studied for coal development.

Thank you for the opportunity to comment.

Larry Clark,

*2122 Graham
N.W. Washington D.C. 20007*

STATEMENT ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT
EASTERN POWDER RIVER COAL BASIN

Submitted by:

THE WYOMING CHAPTER OF THE WILDLIFE SOCIETY

Introduction

The Wyoming Chapter of the Wildlife Society is the local organization of professionals of wildlife management and related fields. The objectives of the Wildlife Society are to develop and promote sound stewardship of wildlife resources and of the environments upon which wildlife and man depend; to undertake an active role in preventing man-induced environmental degradation; to increase awareness and appreciation of wildlife values and to seek the highest standards in all activities of the wildlife profession.

To these ends, this statement is submitted.

Mined Land Reclamation

Emphasis is needed on the present lack of reclamation methods for areas with the climate and soil types of the study area using plants important to wildlife. Private companies, the University of Wyoming and Montana State University have begun research into revegetating mined land areas. However, most of the research was begun in the last two to three years using plant species most valuable to livestock. Long-range success is unknown and considerably more research is needed to determine methods of reclamation with forbs and shrubs vital to wildlife for food and cover. Some species upon which research is needed are skunkbush sumac, sagebrush, rabbitbrush, saltbush, cedar and wild rose.

Though most of the surface of the study area is privately owned, the wildlife habitat is being destroyed or rendered useless by developments to extract federal coal. Restoration of the area should be required and include vegetation necessary to wildlife as well as for livestock.

A procedure is needed for the appropriate state administrative agency to insure that reclamation plans include establishment of desirable topography and vegetation for wildlife in the most advantageous relationships. Advanced planning in this stage of mining can not be over-emphasized.

Legal Section

There is a lack of consideration of the legal requirements and responsibilities toward wildlife of mining companies destroying habitat in extracting federally owned coal. Such federal laws as the Fish and Wildlife Coordination Act, the Bald and Golden Eagle Protection Acts, and Endangered Species Act, should be reviewed and a section included in the Environmental Impact Statement on how these Acts and others will be applied to surface mining.

Additional Mitigating Considerations

One mitigating consideration not included in the Environmental Impact Statement is the purchase of key wildlife range where such range is to be destroyed. Such land would then be managed to support the wildlife populations displaced by the coal mine and associated development.

Also, where surface mining interferes with the natural flow of water through the aquifers and causes the loss of surface water for livestock and wildlife, water should be replaced. One method would be the drilling of wells to deeper aquifers. Replacement of the water should be the responsibility of the mining company.

Railroad Route

The route of the Proposed Burlington Northern-Chicago and Northwestern Railroad line between Gillette and Douglas could have a great adverse effect upon antelope. The Western Alternative Route described in the Draft Environmental Impact Statement would be superior, from the wildlife standpoint, to the Proposed Route by the railroads. The Western Alternative nearly parallels Wyoming Highway 59 and would therefore not add an additional barrier to big game movement, particularly antelope movement. Also, the Western Alternative is located in less dense antelope population areas. These factors are important because the main line will probably be fenced to exclude all big game and livestock by necessity, thus preventing antelope movement across the line.

If severe storms move antelope against the railroad right-of-way fences along the Western Alternate Route it can be detected more easily and probably quicker from Wyoming Highway 59 than along the more remote proposed route. Early detection of problems means early action and prevention or reduction of antelope loss.

Range fires destroy wildlife as well as livestock forage and cover. Fires are inevitable along the railroad route. Wyoming Highway 59 provides access to control fires along the Western Alternative Route and along much of the route Wyoming Highway 59 would serve as a fire break.

Less interruption of public access routes for hunting and other activities would be necessary if the Western Alternative is followed. The Proposed Route will create an additional public access barrier and remove additional area from safe hunting.

To mitigate the adverse effect of railroad lines separating water sources from rangeland used by wildlife and livestock, new water sources, such as wells, should be included as part of the railroad line construction to provide water for wildlife and livestock.

Railroad Right-of-Way Fence

Should the predicted 46 trains per day by 1990 become a reality, big game should be excluded from the railroad right-of-way. The 53 inch fence proposed by the Burlington Northern-Chicago and Northwestern Railroad should exclude all animals. Fortunately the route of the rail line runs north and south and generally parallels most antelope movement.

Spur lines from the mines to the main line, however, will run generally east and west, perpendicular to general antelope movement. These lines would present a serious threat to spring-fall movement south of Wright in Campbell County and in northern Converse County. North-south antelope movement north of Wright is generally by local herds moving short distances. However, during severe storms antelope may move much longer distances and fences which prevent antelope passage could cause the loss of large numbers of antelope. The detrimental effects of some types of fences on antelope are well documented. For these reasons and because the trains on spur lines will be fewer in number traveling at reduced rates of speed, spur line fences should be such that antelope can pass safely through them. General specifications would be fences of three or four strands of wire not exceeding 38 inches in height with a bottom wire barbless.

Energy Conversion Plants and the Land, Water and Air

Sulfur dioxide (SO₂) emissions from coal gasification plants is expected to have disastrous effects on the ponderosa pine and the associated plant communities within 60 to 80 miles of the plant sites. With today's technology, coal gasification plants in the Powder River Basin could have disastrous effects upon the ponderosa pine habitat of the Black Hills, Rochelle Hills, Hat Creek Breaks, Shawnee Hills and Rawhide Buttes areas. Major wild turkey and white-tailed deer are dependent upon the ponderosa pine habitat of these areas and annually contribute significantly to the state turkey and deer hunting recreation and to the local economy.

In addition, it is estimated that each gasification plant will require 1,000 acres for the plant site alone. The large quantities of water not only required to operate but consumed by the conversion process threaten existing water uses and future domestic and agricultural needs.

In view of the overwhelming detrimental effects of coal gasification plants and, to a lesser extent, coal power plants would have upon the region, energy conversion plants should be constructed at or near the areas needing the energy, and not in the Powder River Basin.

Fortification Elk Herd

There are approximately 230 elk in the Fortification Management Area elk herd located east of the Powder River and approximately 25 miles northwest of Gillette, Wyoming. Though the recreation potential of this herd is limited, approximately 100 hunters could hunt on a permit basis annually. With the anticipated increase in population in northeastern Wyoming, additional hunting pressure on elk on the Bighorn Mountains is inevitable. Therefore, the importance and contribution of the Fortification elk herd will be increased.

General isolation is the major condition which allows the elk to remain. Cover is marginal and increased human activity would cause the elk to scatter and ultimately cease to exist.

If protection is given the major elk range in the Fortification area, there is a good chance this herd can survive and contribute recreation and meat as a renewable resource. A protective classification of the federal lands by the Bureau of Land Management would be a significant contribution to the preservation of the herd. Alternate locations for railroads, reservoirs and power lines should be sought. Developments in the vicinity of the Fortification area should be planned to minimize disturbance of the area. With such efforts, the elk can survive. Without the effort, the elk will be lost.

Game and Fish Department Staffing

Considerable effort was made in the Draft Environmental Impact Statement to describe the impact of coal development upon city and county law enforcement agencies. The report is deficient in evaluating the need for additional wildlife law enforcement personnel. It is clear added enforcement personnel will be needed.

Only once was a statement found that the present Game and Fish Department staff will be unable to handle the increased public and industrial demands for wildlife information and recommendations. This fact has not received sufficient emphasis.

General Impact Upon Hunting and Fishing

The Draft Environmental Impact Statement deals very little with the impact which will occur upon hunting and fishing by the increase in people in the area.

Deer and elk populations are at their maximum population numbers. Presently, antelope are at higher levels than private landowners wish and antelope numbers will be reduced by hunter harvest. Habitat loss due to industrial development and increasing human populations will reduce the big game habitat carrying capacity, yet the demand for hunting will increase. In 1973, 74 percent of the deer hunters and 70 percent of the antelope hunters in Campbell County were non-residents (In the entire study area, 60 percent of

the deer hunters and 50 percent of the antelope hunters were non-residents.)). This 3:1 ratio in Campbell County will reverse itself at a rate proportional to the increase in the human population of the area. Some population estimates indicate nearly total resident hunters as early as 1985, based upon present big game populations. It is important that this change be presented, as many businesses and landowners in the area depend, in varying degrees, upon the income of non-resident hunters who pay for food, services and materials. Residents have been very reluctant to pay hunting fees to landowners and rapid, rather significant, changes will have to take place in the attitudes of landowners and hunters if sufficient harvests are to be obtained.

As the number of hunters increase competition for locations and space to hunt is inevitable. Hunting restrictions such as smaller hunt areas and shorter seasons will increase in order to provide maximum recreation opportunity yet maintain maximum producing big game herds. Antelope licenses are presently limited in numbers and competition for these licenses will increase. Deer hunter success has been high but with increasing hunters would be expected to decline.

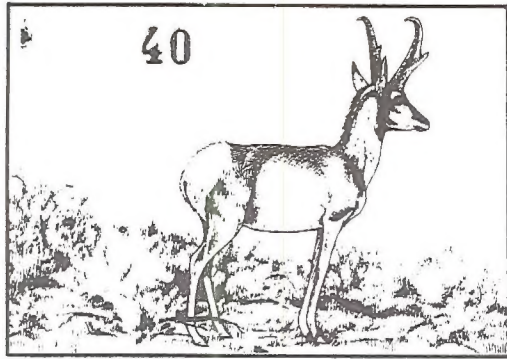
The number of fishermen will increase proportionately with the population growth, crowding the limited fishing areas of northeastern Wyoming. The quality of reservoir and limited stream fishing which residents have known will decline drastically. Development of reservoirs for recreation, including fishing, as mining progresses, would contribute greatly to the recreational needs of the Powder River Basin residents.

Upland game bird hunting is primarily on sage grouse. Though the full potential of the sage grouse populations have not been utilized, there is a limit to the recreation which they can provide. Sage grouse hunting quality that residents have known will also decline due to the increased hunters in the field and competition for places to hunt.

Closing

This statement is submitted by the Wyoming Chapter of the Wildlife Society. The Chapter appreciates the opportunity to submit this statement, and urges inclusion of these views in the final draft of the Eastern Powder River Basin Environmental Impact Statement.

Submitted August 1, 1974
Wyoming Chapter, The Wildlife Society
Roger W. Wilson, President



Sierra Club NORTHERN GREAT PLAINS OFFICE
Post Office Box 721, Dubois, Wyoming 82513

28 June 1974

BY CERTIFIED MAIL

Daniel Baker
State Director
Bureau of Land Management
Box 1828
Cheyenne, Wyoming 82001

Dear Dan:

Enclosed is my written statement and the appendices from the Casper hearing which the Hearing Officer assured me would be included in its entirety in the Final Impact Statement.

As requested by one of the panel members at the hearing, I am putting on paper below a specific suggestion I made in verbal testimony. My suggestion was that any specific decisions relating to this impact statement be delayed for a time period of five years. During this time period, the period suggested in the impact statement as necessary to return land to grazing conditions, research be done on the ability to reclaim land in that time period, water quality changes in ground and surface water from mining and spoil piles, and other questions which I brought up in my testimony. These studies can be done at existing mines in the Gillette area, and the broader questions researched in the whole region.

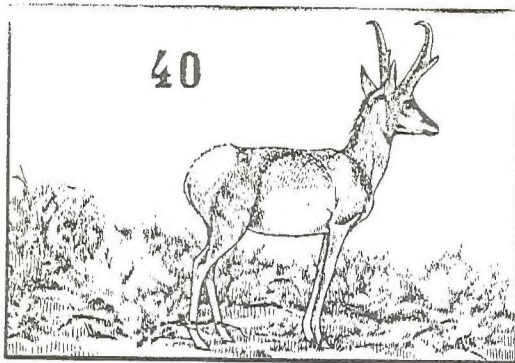
I request that this letter also be included in the Final Environmental Impact Statement as part of my statement.

Sincerely,

Ms. Laney Hicks
Northern Plains Representative

enclosure

VII-661



Sierra Club

NORTHERN GREAT PLAINS OFFICE

Post Office Box 721, Dubois, Wyoming 82513

STATEMENT OF
MS. LANEY HICKS
NORTHERN PLAINS REPRESENTATIVE, SIERRA CLUB
ON THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT
EASTERN POWDER RIVER COAL BASIN OF WYOMING

June 26, 1974
Casper, Wyoming

My name is Laney Hicks and I am the Northern Plains Representative for the Sierra Club. My region covers the states of Wyoming, eastern Montana, Nebraska, North and South Dakota. I request that my written statement and the attached appendices be included in the final environmental impact statement.

We have many reservations and concerns on the document under discussion - The five volume draft Environmental Impact Statement on Development of Coal Resources in the East Powder River Coal Basin of Wyoming.

It is obvious that a great deal of effort has been expended over the past five months by the team that authored this statement and they have our respect for the long hours they have invested in this document. On the part of the Bureau of Land Management and other participating agencies, I believe this is the first real attempt at a limited assessment of the interrelated activity of industrial development in eastern Wyoming.

The Sierra Club questions the purpose of the statement, the timing of its preparation, review period, scheduling of public hearings, and the decisions which various agencies would like to make on the basis of this statement.

I want to assure you that the following rather harsh general evaluation is not given without considerable thought and reflection. As most of you know, I have spent the major portion of my time over the past three years assessing and following the interrelationships of coal development in the northern plains. On a regional basis, we probably have a rather high level of understanding on specific issues, impacts, and analyses, yet the Bureau of Land Management failed to use this resource. Instead of soliciting our knowledge in the beginning, they chose rather, a very limited input, weighted heavily toward those interests who will profit from mineral extraction.

As far as the content of the statement - about all I can say is that it is an interesting and selective collection of reports which only relate to each other now and then if the reader has some imagination. Though there are some good assessments and descriptions, there are many more significant gaps and fuzzy presentations. As a total document I am unable to assess the scope and magnitude of various impacts because most of what I need to know in critical areas has not been told. It is almost impossible on the basis of the statement to have an informed reaction because vital data is lacking, conflicting or not put in an understandable or intelligible perspective. The dEIS just doesn't come to grips with a precise description on the changes which will occur to air, land and water from the proposed single or regional developments. Perhaps even more critical, I cannot gain an understanding on what would be acceptable limits for degradation in terms of human health, future land productivity and usable quality water. The statement does not address these important issues.

If some of these impacts from coal development in the east Powder River Basin are not described in terms of what is significant and likely to happen, then how can the public be expected to approve decisions? Where are the measures and guidelines to insure the quality of the regional environment and public safety?

To cite various state and federal laws stops short of explaining impacts before they happen and shifts the focus to infer that there is adequate protection to deal with problems after they occur. In most cases this would mean degradation down to a low level before the violation of standards would start an enforcement system.

Impact statements should be assessment tools to avoid problems and not a vehicle to pass the buck and fall back on regulatory remedies which might come into play at a later date. In effect this transfer would allow delay in assessing all the important issues until after decisions are made for development. This is an abdication of responsibility.

In terms of these and other deficiencies the purpose of the public hearing is clouded. The technical parts of the report need analysis by specialists and this was not possible in time for these hearings. The rest of the statement is so general that comprehension of impacts is vague and therefore limits informed and constructive input.

These problems in the statement may be due as much to the hasty preparation involved with a telescoped time frame as from the political pressures within the participating agencies. For the record, I think it is important to recognize that the preparation of the statement need not have been so restricted. Knowledge of the National Environmental Policy Act has been available for many years, leases have not been a secret, and the Burlington Northern announced its intentions and filed an application in the fall of 1972 to build a railroad from Gillette to Douglas. Yet for some reason, the federal government waited

until January of 1974 on a decision to begin the preparation of an Environmental Impact Statement. As early as October of 1972, the Sierra Club had notified the Interstate Commerce Commission that we felt Environmental Impact Statements were in order and we have been involved since that time. (Appendix A)

In a broader framework, the Environmental Protection Agency Administrator, William Ruckelshaus, had recognized the need for a, "comprehensive, systematic, and interdisciplinary study of coal development in this region..." in March of 1972. (Appendix B) October of 1972 saw the establishment of the Northern Great Plains Resources Program to provide data and analytical methodology, including development of appropriate models, to demonstrate the economic, social, and environmental consequences of various courses of action. In June of 1973, the Sierra Club and other interested groups filed a law suit stating that a regional impact statement was required under the National Environmental Policy Act. This suit is now on appeal with a hearing scheduled in September. In granting our motion to expedite appeal, the court has expressed concern, "...lest the federal appellees approve applications for coal development activity in the "Northern Great Plains Region" allowing consequential and perhaps irreversible action to be taken before this appeal is decided. The validity of any such approval turns on an issue of substantial public importance presented by this appeal, i.e., whether a comprehensive environmental impact statement, encompassing all of the federal appellees' actions relating to coal development activity in that Region is presently required. To the extent that these appellees consummate any such action pending the appeal, our jurisdiction to decide that issue as to those actions may be defeated.

The Court accordingly urges that substantial restraint be exercised in the granting of authority for coal development activity pending a disposition of this case on its merits." (Appendix C)

The reason I bring up this history is to point out our confusion on the real purpose for the Powder River environmental impact statement. First the government has delayed for two years on recognizing the need for regional assessment, then they telescope the preparation of a statement on a small portion of the region into a few months, schedule the minimum time for written comments and a totally short and unreasonable time to prepare for public hearings. We have protested this accelerated time schedule. (Appendix D)

From where I stand, the whole sequence I have just described looks like a process to grant approval of four mining plans and a railroad right-of-way - with some regional analysis thrown in. I am not criticizing that attempt at regional analysis, only the real impact and decisions which will come out of this five volume statement.

To approve the four mining plans and the railroad right-of-way

will commit other resources which are only vaguely recognized or not described at all in the statement.

In a sense, the draft environmental impact statement has created a dichotomy for the agencies involved - you seem to be caught between a demand to approve certain development proposals and a recognition that the regional cumulative impact assessment is necessary. But, whether through haste or other pressures, the statement fails to meet either goal. On the regional level, the area, facilities, and resources are not defined clearly or consistently analysed from one section to the next - the titles read the same, but the specific items discussed in many cases are quite different. I am never quite sure from one point to the next whether you are talking about four mines or fourteen; two counties or eight, or the whole state; industry employment jobs, total population or service jobs.

The content in volumes III and IV is only a general, superficial rehash of mining plans and statements of rehabilitation intentions. When standards and guidelines are not established in volumes I and II, the specific proposals in volumes III and IV do not face specific requirements which their plans must satisfy.

So they end up repeating and magnifying the generalities of Part I. I do not see that much is accomplished in this exercise, let alone establish a base for decision-making.

The document as it now stands will confuse most readers unless they have more knowledge than the agencies that authored it. And what single person has the broad technical knowledge to fully assess this statement in time for these hearings?

Even though the statement has the major problems I have just described, we are still making a "good faith" effort to comment.

Our research efforts do give us one advantage over the general public - we can evaluate a document and recognize areas which may be incomplete or where certain sensitive and/or controversial issues have been obscured or obviously excluded. We have not had time to review in detail the specific development proposals - in fact, we feel their inclusion is premature with the low level of knowledge on impacts displayed in the regional analysis of volumes I and II.

COAL

The key issue in this whole discussion is coal. Logically then, coal ought to have a complete presentation analyzing it as a basic mineral resource and then the impacts involved in mining it, transporting it, and burning it in power plants. But the draft statement has left me disappointed and without basic understanding on some essential issues, namely toxic trace elements, overburden analysis, shale partings between coal beds, and the significance and impact of these toxic elements. I do not accept the write-off that, "The coal samples from the study

area that have been analyzed for trace element content have shown no unusual or dangerous concentrations," (I-176) or the misleading generalization that, "The concentrations appear to be normal for values as compared to other western coals." (IV-59) The trace elements which should receive special attention are arsenic, fluorine, mercury, selenium, uranium, zinc, boron, molybdenum, strontium, titanium, cadmium, and vanadium, all of which are found in this region's coal. The coal core samples and overburden analyses in the Regional Analysis section and individual mining plans are incomplete, random, and not interpreted for the reader in terms of impact on vegetation, grazing, human health, and in relation to reclamation efforts. Nowhere in this report is there any statement of the upper limits of human tolerance of these elements. What level constitute a hazard? No basis is given upon which to write off these elements as insignificant or normal. How can the public understand if these elements are significant?

This type of omission does not address the problems of what will happen to the elements when they are burned in a power plant or become available for leaching into surface and ground waters when the overburden is disturbed to mine the coal. The cumulative and concentrating potential of these trace elements, according to geologists, can be very significant and we do not feel adequate information is given in the statement for the reader or the agencies to make decisions when there appears to be little understanding of the potential impact from these elements.

With the few coal core samples analyzed on pages I-177-178 in the Regional Analysis there are some significant variations shown which should alert the agencies to further investigation. In existing mines in the Powder River Basin fluorine content in core samples ranges between 30 and 200 ppm. What does that mean in terms of stack emissions each day? Atlantic-Richfield and Carter trace element analysis in volumes III and IV carry fluorine averages in excess of 100 ppm. Kerr-McGee apparently has not even run an analysis on this important element.

Another area which concerns me but is not presented or discussed in the statement is the significance of the parting seams between the coal beds and the thin shale beds within the coal seams. Of these two, the thin shale beds within the seams may be more important because they probably will not be separated out prior to burning the coal. The impacts relate to the excessive amounts of trace elements which, upon burning the coal will either go up the stack or into the ash. If they are in the ash and water soluble they will impact surface and ground water resources. In ash samples they may be even more concentrated than they appeared in the coal parting.

In the coal core sample for the Wyodak mine at Gillette (I-177) an analysis of a shale parting may be shown. I am assuming this

may be the case because the high ash percent (84.9%) suggests that portion of the core was mostly non-carbon in content. In that particular six-inch sample, fluorine measured 200 ppm; uranium, 3.2 ppm; strontium, 150 ppm; titanium, 5,000 ppm; and vanadium, 150 ppm. What does this mean for air and water quality?

The statement's discussion on overburden, surface geology, and soils, is interesting, but it does not cover the whole picture. Slow soil development, high erosion potential, low infiltration and permeability rates are recognized for the problems they will cause during reclamation (I-143-144). It is fine to list all these things, but it cannot stop there. How bad is it going to be, how bad should it be allowed to be, and what specific measures will control each problem?

Aside from the fact that the predominant overburden is of a rather sterile shale character, there does not seem to be any information again on trace elements. Atlantic-Richfield even goes so far as to assert that, "Preliminary tests indicate the overburden does not contain any toxic materials." (III-12) But then a table further on in Atlantic-Richfield's plan shows analysis of an overburden core recognized to have toxic elements. It shows from one to five sections which have a "high level of plant-available boron", and one level of "high extractable lead." (III-45) Two other overburden samples (III-46) show zinc running between 90 and 240 ppm; strontium from 120 to 370 ppm; titanium from 1,100 to 3,500 ppm; and significant intermittent levels of vanadium, molybdenum, and uranium. Still another table (III-48) on overburden analysis at Atlantic-Richfield's proposed Black Thunder mine shows interesting levels for several other toxic elements. What will be their effect on people and their air, land, and water when they go up a stack as gas emissions or are leached into water tables from ash disposal and spoil piles?

We have tried to contact experts to understand the given material, but we have run into a stone wall. Why should we have to contact outside experts? The material should be in the impact statement in an understandable form. And we should not have to get technical experts to translate this information. It appears that the authors of this report do not have the information either.

Because many of these chemical constituents will have impacts when the coal is burned and the overburden disturbed, it seems incumbent that before the agency decisions are made we have more detailed information on the distribution of the toxic and trace elements within each coal seam as well as the seam partings and the overburden. For example, it may well be found that most of a given toxic element will be found in the bottom two feet or the top two feet of the seam and could be eliminated from causing any problem. There should be detailed core sampling at intervals of two feet throughout each bed as well as stratigraphic sampling of outcrops and geologic formations unit by unit. Without this information and discussion of the interactions, I do not think decisions will be in the public interest. The costs involved for coal analysis are minimal.

Another limitation of the impact statement is the measurement of available coal. The common reporting method is to cite reserves and resources in tonnage figures and without question, this fuel measured thus shows considerable abundance. According to the impact statement, low-sulfur coal is useful to meet air quality maintenance standards and the West has about half of the easily strippable low-sulfur reserves. However, there are other ways to measure coal reserves such as a consumer index based on heat value. This method reflects the tonnage necessary to obtain a given heat output rather than a tonnage total of reserves in the ground. A recent National Science Foundation study released in November 1973 describes current coal reserves in terms of heat content. (NSF Grant GI-35821)

The results described in the paper show a different perspective on the demand for western coals and should be incorporated in the Powder River Coal statement. The researcher demonstrates that if coals are measured in terms of heat content, that is, the measurement that would interest a purchasing utility company, the recoverable coal reserves in the West in the low-sulfur category are reduced substantially. Because western coal has a low heat value, it takes more to produce a given amount of heat. "Unfortunately, in consuming the additional tonnage of low Btu coal to make up the Btu differential, the sulfur content of the additional tonnage is also emitted. Therefore, the amount of sulfur in the additional tonnage must be included to determine a comparable sulfur content..." "The importance of the distinction between high and low sulfur coal arises because sulfur oxide pollution control regulations prohibit the emission of more than 1.2 pounds of SO₂ per million Btu's of heat generated by the burning of coal in new plants. To meet this standard, a coal containing 24 million Btu/ton cannot contain more than 0.7 percent sulfur by weight. Coals with a lower heat value must contain correspondingly less sulfur if they are to meet the standard." "This is the equivalent of shifting the lower Btu coal out of the \leq 0.7 percent sulfur category and into the 0.8-1.0 percent sulfur class." (all quotes, NSF Grant GI-35821, page 2)

Subbituminous low-sulfur coal containing up to 0.7 percent sulfur classed by conventional tonnage methods gives a substantial reserve in the Northern Rockies, but when classed according to an effective sulfur content burned in power plants, 85 percent of the reserve shifts over to the medium sulfur class of coal reserves. This also means that western coals with low enough sulfur to meet national standards will be in short supply in the very near future.

Evidence that western coals may not be acceptable to meet air standards was shown in a recent decision in Nebraska involving a construction permit for a power plant to use coal from Atlantic-Richfield's Black Thunder mine. The hearing officer has recommended denial of the construction permit because the Nebraska Public Power District has failed to show that Atlantic-Richfield's coal will not exceed the sulfur dioxide standard. The hearing officer also ruled that the proposed plant would cause significant deterioration of the existing air quality in the Platte River valley, and that the

Nebraska Public Power District should change it's plans and specifications to include the most effective flue-gas scrubbing device.

AIR

The treatment of air quality and pollution in the impact statement is disappointing and will probably not be understood by most general readers. Our existing air quality in the Powder River Basin is about four times cleaner than the national secondary standards for particulates (I-131). With the exception of areas around the Dave Johnson Power Plant visibility is a hundred miles most of the time and the eight county area presently has only this one major pollution source. The statement however, carries an uncertain note that suggests maybe we should not think too highly of our clear air because there is little supporting data presently available on the existing quality (I-134). One table in volume II (I-647) shows the amounts of emissions that we might expect though it is not stated whether this will be from the total of 1780 mw new production (I-459) or 2780 mw (I-56; four times 500 mw plus Wyodak 780 mw addition) or includes present emissions. At any rate, it is not interpreted for its significance to the general reader. Those figures on emissions in the Powder River Basin show that by 1990, we would have particulate emissions equal to half the present Los Angeles emissions from all sources. Sulfur emissions would equal three-fourths of the Los Angeles daily emissions (I-647).

Another air pollution table calculates the emissions for the Casper and Wyoming Intrastate Regions - or a total of nineteen counties excluding the southeastern part of the state. Then it takes the new pollution sources which could come from plants in Converse and Campbell counties and adds them to the nineteen county figures. The result is a relatively small percentage increase in pollution because a large area is averaged in. But the statement leaves out the percentage increase from present to future pollution levels in the Powder River Basin.

It seems as though this table deliberately misrepresents what will happen to the Basin air quality.

I would also like to point out that the large figures on carbon dioxide have little meaning and are probably included to make sulfur and nitrogen oxides look small. Carbon dioxide is not a harmful element to human health. In addition, figures for carbon dioxide in the table on page I-649 are probably not correct - they add carbon monoxide to carbon dioxide figures which is like apples and oranges. Also, an increase from 300,000 to 6,000,000 is more than a 185 percent increase.

Another impact not discussed is the cumulative air quality changes made when emissions from power plants are combined with gasification emissions. Power plants produce large quantities of nitrogen oxides and gasification plants release hydrocarbons. When they combine with sunshine, they cause photochemical oxidant problems

typical in large urban areas. What happens when southwest winds bring the trona pollution over to combine with the other emissions?

The air pollution sections do not consider downwind concentrations and effects and they are far more important than the averages over a two county or a nineteen county area. Certainly some information exists to predict a general pollutant dispersion. For example, surface wind patterns can be studied through the location of sand dunes which occur in a regular pattern from southwest Wyoming to northeast Wyoming. This easily observable measure shows the direction of prevailing winds and the surface wind channels and the consistency and wind velocity. NASA's Earth Resources Technology Satellite has been employed in Wyoming to produce a variety of geologic and related studies. Dr. R.S. Houston at the University of Wyoming gave a paper in Casper recently showing examples of cooperative studies between botanists, plant scientists, and geologists for preparation of maps of surface resources that can be used by planners and for environmental impact studies. This kind of information should be in the Powder River statement but no doubt the hasty preparation precluded the time involved to gather this basic data?

Uncertainty about the modelling methods should not inhibit a description on the areas downwind and around the plant that will receive the bulk of pollutants.

What about distribution of toxic and trace elements? The United States Geological Survey is presently working on some downwind effects of trace elements below the Dave Johnson power plant. I tried to obtain some of their results. I was turned down on the claim that the investigation is in a preliminary stage. (Appendix E) This is an important consideration and I can see no point in doing this work unless it is available in time to be considered in decisions.

Two options are discussed for emission control - electrostatic precipitators and wet scrubbers. Interestingly, these options are presented under a description of development rather than under mitigating measures where they seem more logically to fit. The discussion as it now stands is a promotional presentation supporting precipitators over scrubbers. Instead of a balanced weighing of trade-offs, the statement lists most of the positive assets for one and many negative points for the other (I-91-93).

Additional trade-offs on pollution control equipment which should be discussed are the effects of the distribution of sulfur as a stack gas over the surrounding countryside and human population or as a sizeable waste disposal problem at the plant. The statement also shows a comparison that scrubbers use twice as much water as precipitators. This assumes a once-through use and omits the potential to re-cycle 95 percent of the water back through the scrubber. On pages I-803-804, the impact statement implies on the basis of a 1970 source that scrubbers are not yet feasible. However, at hearings last fall, the Environmental Protection Agency

took the position that scrubber technology is available. Also the Sulfur Oxides Control Technology Assessment Panel in April 1973 reported on a number of facilities in Japan which are operating reliably on flue gases of similar composition to those from western coal-fired power systems. Many units are available commercially which report sulfur removal of 90 percent or better (Cottrell Environmental Systems, Inc.; Chiyoda Chemical Engineering and Construction Company).

RECLAMATION, SOILS, VEGETATION

The impact statement has scattered its discussion of mine land reclamation under mining methods, soils, vegetation, and wildlife...and its difficult to understand how rehabilitation potential is actually being assessed. In the analysis guidelines (I-59) there appears to be recognition that mining will have an overall degrading impact on the mined areas. We compliment the Study Team for recognizing that, "There will be a fifty percent loss in productivity for grazing purposes. This will occur even if the entire area is revegetated." It should go further and recognize a ninety percent plus loss in productivity for most big game, as described in the wildlife section.

I am not exactly sure how they arrived at the fifty percent figure. There seems to be no definition of reclamation that will support livestock grazing and little data in the statement or elsewhere that I am aware of to show that much of anything will grow in five years (the lag time given between mining and livestock use on spoils), let alone support any use. Wildlife and livestock may come in and graze early rehabilitation growth, but this is not a measure of suitable grass species, that an area will support animal use, that soils are stabilized, or that vegetation can sustain itself in future years.

For us, it is not a matter of picking on the mining industry or whether we believe the statements on reclamation made by both industry and some agencies, but rather the fact that general statement of intention does not rise to the status of evidence. The impact statment says very clearly that, "With the semi-arid climate prevalent for the study area, successful revegetation on the severely disturbed mined areas is unknown at this time." (I-655) While the acreages disturbed by present mining proposals may be a small percentage of the total area, we cannot write it off as a sacrifice area when the "loss will take place in probably the most productive area of the Eastern Powder River Coal Basin..." (I-477)

At this point in time, the statement should recognize the state-of-the-art on reclamation has only adequate information to describe backfilling and grading. But proper hydrology, land stability, drainage control, maintenance of vegetation, protection of acquifers, and interaction of toxic and trace elements cannot be assured, documented, or discussed to any great extent. This leaves a very rickety structure on which to make decisions.

Available soil moisture is rightly recognized as a major determining factor in attempts for reclamation and as the present

controlling factor on the existing character of the land. (I-78) A chart in volume I (I-125) shows annual precipitation and the evapotranspiration moisture budget. From April to October, evaporation exceeds precipitation by 9½" at Douglas and Gillette and 12" at Dull Center. What does this mean for establishing any plant cover? In the mitigation section of volume II (I-631), no connection is made with this chart, but there is a weak suggestion that irrigation systems may be necessary during extended dry periods. If the evaporation exceeds the precipitation in the growing season now, will not the situation be aggravated with increased evaporation in unconsolidated spoil piles or in runoff if the soils material compacts and crusts? To what extent will this affect said reclamation potential? And further, if irrigation is established as a necessity, what salts and trace elements will be leached up to the surface or into the streams and ground water? What is an acceptable level for rehabilitation failures and on-site as well as off-site impacts to water?

The impact statement refers to the National Academy of Sciences' study on rehabilitation potential of western mined lands and in particular, their assumption that on the basis of rangeland rehabilitation, comparable mine spoils can also be reclaimed. As with the National Academy of Sciences' study, the impact statement fails to make the connections which would establish a similarity between mine spoils and a poor or disturbed range

According to the impact statement, even abandoned farmlands in the Powder River Basin have only partially recovered. (C-41) A chart in the statement depicts recovery of various plant and shrub species on abandoned farmland (I-506) and on the surface it looks optimistic. But if the reader compares this graph with an explanation in Appendix C, the chart has a very different meaning. When I first studied figure 6 in Chapter V, I thought the percent figures were the number of plant species. The explanation in the Appendix gives a whole new perspective - the percent figure represents the amount of cover as well as plant species. This adds impact to the figure and shows that, "...after nine years, the total vegetation cover was only slightly over three percent; cover was less than 50 percent of that found on adjacent undisturbed lands." (C-41)

The Appendix also states that in the Atlantic-Richfield lease area, farmlands abandoned 40-45 years ago, still have only 57 percent cover compared to the adjacent undisturbed lands. Lands disturbed by mining might well have even longer recovery periods and this leaves me questioning the analysis guideline that reclamation will only take five years before grazing uses are re-established.

I am further disturbed at the assumption on the five-year recovery rate because of additional information given in the Appendix. "Once these sagebrush grasslands have been severely disturbed they may be unable to recover. In 1965, twenty plus years after his early research, Lang found that the vegetation on his original abandoned farmland study area (in Converse County) actually deteriorated further rather than improving. Total ground cover decreased

by forty percent (Lang 1973, page 408). This happened under conditions of grazing and climate which cannot be considered uncommon for this region." (C-43) What is the basis then for assuming that proper conditions will exist for grazing in five years? fifteen years? fifty years or even one hundred years? The National Academy of Sciences' study does not supply it, studies of range rehabilitation in Converse County do not supply it, and the statements of intent both by industry and the agencies authoring this impact statement do not rise to the level of evidence.

What kind of standard does this contradictory presentation on reclamation establish for the area? What it means to me is that no evaluation has been made on its significance, and no analysis has been made to describe the scope of impact. Not only will the acres disturbed be many times larger than indicated, but also the estimates on time necessary to establish any kind of vegetation will be much longer than the statement suggests. With a short time frame of five years, the mining companies will not be required to do much at all.

Maybe many of the mine areas will be under alkali lakes and loaded with toxic trace elements. This impact was described early in June by Dick Keefer at the AAPG-SEPM Annual Meeting. This is a very real possibility recognized also in the Northern Great Plains Resources Program, Water Work Group, pages 81-83 (Draft, April 1974), Water Quality Subgroup, page 170 (Draft, April 12, 1974), Ground Water Subgroup, page 43 (Draft, April 1974). The impact statement does not really come out and talk about what will happen at these lakes. And there is only one brief mention that this problem might happen at all and the need for research. It denies altogether that water quality in aquifers will be affected except locally in the mines. The whole discussion of this significant impact receives all of four short, confusing, and vague paragraphs (I-499-500).

Without clear discussion, how can you expect the public to decide if they do or do not want these impacts? To say the evidence is unclear or not available again shifts the problems and costs to a later date.

Mining and reclamation of mine lands is described as having extensive impacts on wildlife and wildlife habitat three to five times larger than the actual acres disturbed (I-525). In addition there will apparently be a disruption of existing interrelationships - big game species and birds decline and rodents and predators increase. That balance is not likely to please very many groups that use the area.

Where is there discussion in the statement to mitigate these substantial impacts on wildlife?

The discussion of spoil characteristics does not convey much understanding on impacts, in fact, the data is conflicting from one page to the next. Atlantic-Richfield claims no toxic elements in overburden and then promptly displays several tables that show there are dangerous levels. In the mitigating section of the re-

in overburden and then promptly displays several tables that show there are dangerous levels. In the mitigating section of the Regional Analysis, acknowledgement is made that, "Some...layers may contain toxic materials such as boron, arsenic, selenium, or pyritic sulfur." (I-628) This is an incomplete list, but the text goes on to say, "Analysis of the surface soils and overburden should be made and examined for concentrations of toxic materials in relation to stratigraphic occurrence. Mining operations will be planned to provide for the segregation of spoil materials toxic to humans, animals, and vegetation." But here the statement fails... it does not establish for the reader what is a toxic level, and it does not explain the feasibility of segregating out many strata of overburden for special control. How can the public then, determine what the real impact will be and whether mitigation is adequate or enforceable? What are we to make of a statement that disclaims a toxic material problem and then promptly shows there is one?

Selenium may be a particularly hard problem. It is known to be widely present on the outcrop and subsurface coal sections of the Wasatch and Fort Union Formations, and the study area is no exception. The impact statement has not given clear understanding or much space to the distribution of this element or its presence in vegetation and effect on livestock. Neither the soils or vegetation descriptions in volume I give material important to judge this selenium factor....its stratigraphic occurrence, how it will act if exposed to irrigation, the indicator and converter plants, its toxic level and concentrating ability in plants and animals, interaction and effect when combined with other toxic minerals such as molybdenum and vanadium, prevention and control of selenium poisoning, and the extent of impact when converter plants make the selenium available to all plants. The presence of selenium converters relates directly to the program of stripmining and stockpiling of soil for attempts at reclamation. Poisonous soil layers should not be spread out.

Information on selenium is available in many Wyoming Agricultural Experiment Station Bulletins, and articles in Science and other scientific journals, as well as two textbooks, including Selenium, by Irene Rosenfeld and Orville Beath (University of Wyoming, 1964). I do not understand why it has not been included. The only reason I picked up on this deficiency was because of some previous research I did two years ago on a water project that would have irrigated lands high in water soluble selenium. I know the impacts from this element are significant and the general public should have a clear presentation of the problem in order to make a rational decision.

WATER

Water is probably the most important resource to the present residents of Wyoming and especially those in the proposed coal development region. The Powder River Basin is a water scarce basin, and though this is contrary to the projections of the State Engineer, I do not believe the Basin has any excess water available for appropriation. The impact statement does not give me a clear picture of water available in the Campbell-Converse County area or the larger eight county area. But even with a small amount of knowledge, it can be assumed that the whole state will be involved once the Powder

River Basin is committed to industrial development. This impact outside the two-county area is mentioned in the statement, but the effect of diversions and new storage facilities is not adequately covered. None of the specific proposals in this statement require large amounts of processing water; the mines will have more impact on water quality. However, the associated industrial development some of which is mentioned in the statement, would have large water needs. But at that point, the statement shifts from a focus on the state's available water to the limited development of the few proposals in the two-county area. This leaves out discussion of water needs for industrial development proposals in the Buffalo-Sheridan area and the Green River Basin. This is the same pattern followed in presenting air quality: take the large total figures and then make it look like a small percentage that will be needed in the two-county area. This allows discussion of an apparent abundant resource and creates the appearance of minimizing conflicts and level of impacts.

On the availability of surface and ground water, the information is inconclusive and confusing. In one place the statement leaves the reader with the impression of water scarcity - "...during most years only those rights with a priority dating before 1900 have a dependable water supply during late summer months." (I-258) There is no table to show me what this means in terms of acre-feet and the number and location of water rights. What percentage of the rights have a dependable supply? How many water rights and acre-feet are on file after 1900? Where are all these rights located in northeast Wyoming and how would they be affected with new dams and ground water wells? None of this information which I need to assess impact is given.

Instead, the statement gives me general figures on estimated depletions in northeast Wyoming (I-259) and acres under irrigation in northeast Wyoming (I-260), percentages in interstate compacts for northeast and northwest Wyoming (I-261) and filings for potential reservoir sites in northeast and southeast Wyoming (I-263-264). Each table covers a different area and uses a different measurement so there is no way I can understand the meaning of these figures to judge the kinds of impacts that will be involved.

On page I-262, the statement denies some interstate compacts are within the analysis scope of the environmental impact statement and then includes the filings for new reservoirs on one of those rivers. All this conflicts and gives the impression of water availability and denies the need to look at associated impacts.

In the impact chapter, potential water sources include the North Platte River as if it were within the study basin when it actually should be in the Imported Water column along with the Green, Shoshone, Yellowstone, and Wind/Big Horn Rivers.

Some lines should be drawn on which rivers will be specifically analyzed and which ones will not...the constant shifting from one table to the next makes for confusion and an inability to assess impacts.

Using the figures in the statement on "unused and unappropriated water" there is a stated availability of 96,000 acre feet per year for the Powder River drainage. (I-265) Reservoir filings for the Tongue River total close to 370,000 acre feet capacity and 790,000 acre feet capacity for the Powder River drainage (Table 26). Are these applications in excess of the stated flows and water availability even with development of large carry-over storage? Who loses their water right once an industry is established and dependent on a certain supply? How does the state react to these late filings and protect the earlier rights? Is it the position of the environmental impact statement that condemnation and purchase of water rights is a positive or negative impact on existing uses? The statement is apparently shifting this decision to state officials (I-266), but federal actions are the initiating actions which could cause the change.

I looked at surface water availability and needs in the Tables on pages I-53, I-58, I-263-264, I-486, I-487, I-488, and I-489 and became hopelessly confused. These Tables are not drawn together with a clear description of their meaning and impacts. The Table on water requirements for the study area on page I-53 evidently goes with I-486 in the impact chapter. But the study area water requirements in the assumption section used for analysis of cumulative regional impacts (I-58) does not seem to fit anywhere and the figures are quite different. None of the Tables relate irrigation figures to adjudicated acres or permits in good standing. "Structural Basin" is not defined to be the eight-county area, northeast Wyoming, or all of eastern Wyoming. There is no understandable comparison between present storage and future storage as they relate to yearly fluctuations, stream flows and evaporation. It is not clear if the Powder River drainage has enough water to cover its needs, where the water is located, and transportation systems needed. What portion of the Tongue River water might go over to the Powder River drainage? How much North Platte water? Some estimate for reclamation water requirements should also be made.

Tables showing water available (river basin and acre feet) as compared to industrial needs (acre feet) does not describe the impacts. There are vague suggestions that present surface uses might suffer significant impacts, but where and by how much? If we cannot locate the change areas, how can we assess what specific uses will be impacted? Instead, the statement says the amount of water to be obtained from surface and ground sources cannot be determined and that each company, within legal constraints, will develop their own water. (I-490-491) This would make it seem, then, that this environmental impact statement will not assess water use impacts with any specific knowledge.

Present surface water quality in northeast Wyoming is not described with any clarity or interpreted for reader understanding. Mention of a few common chemicals and ranges for dissolved solids does not give the level of detail which is meaningful. The draft

Water Quality Report of the Northern Great Plains Resources Program, said to be an information source for this environmental impact statement, has more data in an understandable form. Especially relevant here is that report's notice of the high load of dissolved solids in the Powder River (page 137). Potential water storage reservoirs might silt up rather quickly.

The only direct water impacts the Regional Analysis (volume II) gives thought to is from the mining operations. The mining plans (volume III and IV) are equally as general though they name stream locations.

The description of the ground water resource consists mostly of brief descriptive presentations on the geologic layers, lots of tables and figures which are not interpreted. In other words, this is garbage as far as importance in understanding the areas that will be impacted.

The key issues I need to know about are the quality and quantity of the resource. The quality information is fuzzy and not interpreted and the estimates of quantity available are not explained or supported. Though I could have overlooked some significant discussion, the 150,000 acre feet figure of ground water availability which shows up in the tables of volume II, Chapter V on Impacts does not seem to have a source in the previous chapter. How was this figure arrived at? On page I-54, this figure is used as the annual recharge rate, but I cannot find out how or where this figure came from.

Tables 28 and 29 (I-227-228) looked related to an assessment of ground water quantity and I was particularly interested in understanding that large area in the center of the map labelled, "Area of No Control." I find out it means there is no data available on the Madison Limestone in terms of water yield, flow, and recharge. There are not even any figures on the recharge of the Madison at its outcrop along the Big Horn Mountains. The recharge area is not very large compared to the thickness of the formation in the central part of the Basin, so the rate of recharge may be slow. The United States Geological Survey study mentioned (I-225) is not likely to add much to the voids in the maps - they are looking at existing wells along the margins of the Basin. So what is the basis for ground water availability of 50,000 or 150,000 acre feet? If it is not there the impacts and pressures are shifted to the agricultural uses?

The Tables on ground water quality (I-203-207) are not interpreted and they are incomplete on trace and toxic element analysis.

The water impact section does not discuss in full the water quality or quantity changes that will occur from interrupting aquifers. It does recognize that wells and springs just west of the mining area will probably be dried up, but it has left out entirely the very real possibility that the many wells east of the mining

area will also lose their water source. Lakes which form in the mining cuts will be alkali, and sulfates will be trapped in the mine hole. Probably the water level will not reach high enough to recharge the aquifer on the east side due to evaporation and infiltration. Even if it does reach a high enough level to recharge the aquifer, the water quality will be very poor due to leaching of salts and various trace elements in the overburden.

The summary of water impacts (I-502-503) essentially says the statement will not assess the impact of water uses and the agencies do not know the magnitude of impact on water quality. After that conclusion, the only thing left for the mitigation section (I-617-618) is to cite water quality standards. It is not even possible to know how or when these laws will be needed because the statement does not define impacts that would occur.

The water section on unavoidable impacts is merely a re-statement of the water demand figures and selected impacts from Chapter V.

SOCIO-ECONOMICS

In terms of socio-economic impact we are primarily concerned on the basis of the Rock Springs example that we will not have the tax base to build additional services which will be necessary with a doubling and tripling of the populations of Douglas and Gillette. We see no way or justification for the existing residents to shoulder the economic burden to support this new influx. And it is not fair for a new population to be housed in inadequate facilities. Nowhere does the statement give any estimates on the costs of increased services and facilities (hospitals, schools and teachers, police force, sewage disposal, etc.), and how much it will cost the present residents of the state. All this expense comes before any revenue is realized from new plants or the increased circulation of income from new residents.

CONCLUSION

The Regional Analysis of the East Powder River draft environmental impact statement represents only the extremes between generalities and detail. It exhibits unintelligible and conflicting technical nomenclature and measurements and on the other end, cliches and motherhood statements.

As a concerned member of the public who has just spent two weeks carefully trying to get through the statement and collect some impression on the level and scope of impact, I am only more confused. I feel as though I have been playing with a marshmallow and the more I try to understand the different sections, the stickier it gets.

I might draw two conclusions - either the agencies do not understand the impacts, or they do not want the public to understand them.

Because information in the statement is conflicting in terms

of data, assumptions, and descriptions, and because there is not clear communication on where significant commitments and impacts will occur, there is little basis for decisions by the public or the agencies. Approval of any of the actions discussed in the statement without adequate understanding by the public and the agencies would compromise the position of existing residents and the state in terms of managing future development in the area.

The draft should be re-written to incorporate at least the most important of the deficiencies enumerated in the foregoing pages of my statement.



mineral development corporation

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ENGINEERS ARCHITECTS PLANNERS 2110 SOUTH ASH STREET, DENVER, COLORADO 80222 (303) 757-5426

August 2, 1974

Mr. Robert T. Browne
Bureau of Land Management
P. O. Box 1823
Cheyenne, Wyoming 82001

Dear Mr. Browne,

Re: Review and comments on the Draft Environmental Impact
Statement--Development of Coal Resources in the Eastern
Powder River Coal Basin

On behalf of Burlington Northern Inc. and Chicago North Western Transportation Company, the following written comments regarding the draft Environmental Impact Statement are submitted. It is our belief that the draft statement fully complies with the congressional intent of the Environmental Policy Act of 1969, as amended in 1973.

We have made a number of comments on Volume III of the EIS, which we feel should be incorporated into the final EIS. Some of the attached information represents relatively new data which has been developed by the engineering departments of the respective railroads. These comments are grouped into the ten categories shown below:

- 1.) SURFACE DISTURBANCE
- 2.) ALTERNATIVES
- 3.) RECLAMATION
- 4.) FENCING
- 5.) WAYSIDE FIRE
- 6.) TRAIN OPERATIONS
- 7.) ARCHEO/PALEO
- 8.) DRAINAGE
- 9.) SOCIOECONOMICS
- 10.) UNDERCROSSINGS AND OVERCROSSINGS

We appreciate this opportunity to provide input for your final EIS.

Yours very truly,

A handwritten signature in dark ink, appearing to read "Doug Ross". The signature is fluid and cursive, with the first name "Doug" and last name "Ross" clearly distinguishable.

Douglas M. Ross, P.E.
Director of Environmental Sciences
VTN, Inc.

DMR/njw

1. SURFACE DISTURBANCE

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References: Pages II-3, P 4; II-91, P 1; II-129, P 3

"Construction slopes on cuts of 40 feet or less shall be on a 3:1 slope. Those cuts greater than 40 feet shall not exceed a 2:1 slope."

"Right-of-way widths are based on the area necessary for cut and fill sections. Right-of-way width will vary from 150 to 600 feet. Total amount of land required for the right-of-way is approximately 2,400 acres."

"Impact on soils will result from disturbance of 2,400 acres within the right-of-way, removal of 1,100 acres from productivity . . ."

Comment:

The total amount of land required for the right-of-way is approximately 3,600 acres using maximum 1 1/2 to 1 cut slopes. At a 3:1 ratio the amount of land would increase to 4,700 acres. If a 3:1 maximum cut slope ratio is imposed along the entire route, an additional 6 million cubic yards of material would have to be removed at an added cost of 5 million dollars. This would require acquisition of a wider right-of-way resulting in substantial acreage being taken from existing land use. The total land required for the preferred route is estimated to be 3,600 acres using a maximum cut slope of 1 1/2:1. By requiring a 3:1 slope, the right-of-way requirement increases to 4,700 acres. Cut slopes in the range of 1 1/2:1 to 2:1 have been successfully constructed and revegetated on the new Interstate Highway 90 from Gillette to Buffalo, Wyoming, without creating adverse visual impacts to the traveler. In addition the railroad has successfully revegetated 1 1/2:1 slopes in Wyoming and Montana thereby negating any erosion potential. Since it has been shown that erosion can be sufficiently controlled on a 1 1/2:1 slope, this is preferable when weighed against the disadvantages of the alternatives. These include 1,100 additional acres removed from existing productive land use, greater maintenance required, longer distances necessary for wildlife to traverse and the additional coal reserves removed from production for the duration of the route location.

"All ephemeral and intermittent streams will be culverted to allow passage of normal streamflow. All diverted drainages will have drop structures installed along diversion sections to prevent headcutting."

Comment:

Drainage culverts will be constructed with asbestos bonded corrugated metal pipe or reinforced concrete pipe. Where an opening greater than 108 inches in diameter is required by hydraulic conditions, the railroads will have the option of installing a bridge structure or a larger pipe or conduit.

In some instances it might be necessary to protect an existing pipeline with an outer casing pipe to insure against damage from railroad loading. Under other conditions it may be possible to construct sufficient fill material over the pipeline to afford a large margin of structural safety without a protective casing.

From a hydraulic design standpoint it is not good engineering practice to arbitrarily install drop structures along all diverted streams. If there is no significant change in the stream gradient caused by the diversion, the drop structure would serve no purpose.

9. SOCIO ECONOMICS

Comments:

Comments were made during the public hearings concerning the projected socioeconomic impacts of the activities described in the draft. The report prepared by Denver Research Institute on the socioeconomic impacts of the proposed Burlington Northern and Chicago North Western rail line is enclosed for further reference. The report includes a general description of the existing economic and social conditions, a profile of rail and coal development to 1980, impacts of the projected development and recommended measures to alleviate these impacts. The results of a household survey conducted in addition as part of this study indicated generally favorable attitudes toward development.

Government agencies and the industries involved are responding to an awareness that socioeconomic impacts will occur by taking positive steps to accommodate the projected growth. The Governor has organized several task force groups composed of State, local and industry representatives to examine the issues and develop policies and programs to deal with the problems. In addition to cooperating with public agencies in their planning efforts, many cases industry is also taking the initiative in assessing growth resulting from individual projects and investigating alternate methods of lessening growth impacts.

10. OVERCROSSINGS AND UNDERCROSSINGS

References: Page II-27, Table 2 "Highway 59, Sec. 28, T35N, R70W - Railroad Undercrossing"

Comment:

This line should be revised to read "Highway 59, Sec. 28, T35N, R70W - Railroad Overcrossing."

July 31, 1974

State Director
Bureau of Land Management
P.O. Box 1828
Cheyenne, Wyoming

Dear Sir:

I am sorry that this will probably pass the deadline before you receive it but hope that it may be considered anyway.

Several points were ignored in the draft statement that I think should have been included.

One is the lack of information on the vast amount of Wyoming ranch land that has been absorbed by the coal companies in the past few years. Coal prices have badly inflated the values of grazing land in the area and virtually every ranch sale in this area is made to a coal company. Prices have been reported in excess of \$40,000.00 an animal unit for grazing land in this area. At the same time a rancher could possibly pay \$2,000.00 per animal unit for the same ranch. This is going to create severe probabe problems for ramily ranches that go through estates and will probably mark the end of the family owned ranch in this area. I would estimate that better than 100,000 deeded acres have been sold to coaa companies in Campbell County in the past few years.

No mention is made of exploration drilling the impact of surface damage from drill hole tailings or the damage to underground water sands that are repeatedly pierced by drill holes.

Oil seismograph, uranium and coal exploration all have covered this area. On our ranch we have been drilled across by all three explorations. The deepest holes have been 1,500 feet to 2,000 feet deep, with the average at something around 250 feet. In some areas, holes are drilled to this debth on 100 ft. centers. The sterile soil is brought to the surface and covers the top soil for an area of maybe a rodd square.

The drill hole itself is "plugged" only at the surface and I have seen drill holes flowing water that were plugged with a post driven into the drill hole.

Thank you,

Sincerely,
Leland D. Turner
Leland D. Turner
Turnercrest Ranch
Gillette, Wyoming

VII-693



Nebraska Public Power District

GENERAL OFFICE
P.O. BOX 499, COLUMBUS, NEBRASKA 68601
TELEPHONE (402) 564-8561

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August 1, 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

Nebraska Public Power District (NPPD) submits the following comments on the Environmental Impact Statement for the development of the Eastern Powder River Coal Basin.

Nebraska Public Power District is a public corporation and political subdivision of the State of Nebraska. Its service area encompasses 85 of the State's 93 counties and portions of two other counties. The District operates an integrated electric utility system, including facilities for generation, transmission and distribution of electric power and energy at retail and wholesale. The District serves at retail 268 municipalities and communities and supplies at wholesale the total requirements of 80 municipalities, public power districts and cooperatives accounting for approximately one-half of the electric power load of the entire State. The demand on the District's system has been growing steadily, and based upon historical growth trends the District's total resources in future years are shown in the following:

<u>Year</u>	<u>Total Resources (MW)</u>
1974	1789
1976	1864
1978	2322
1980	2448

To meet these future load requirements the District has under construction at Sutherland, Nebraska, a 650 megawatt generating unit designed to use coal as a boiler fuel. A similar type unit has been announced and scheduled

for commercial operation in 1980.

The decision to use coal as a boiler fuel for these units emerged from the fact that (1) no source of gas or oil in sufficient quantities and meeting State and Federal environmental regulations was available; and (2) the lead time necessary for the construction of nuclear units precluded their use. The only source of coal available in sufficient quantities, able to meet environmental requirements and capable of being developed in the allotted time frame was located at least in part in the Eastern Powder River Coal Basin.

To secure fuel for the first unit, NPPD contracted with Atlantic Richfield to supply coal for a period of 15 years with 3-5 year option. In order to meet our proposed schedule, the shipment of coal from Wyoming must begin in 1977. For such shipments to be made on time it will be necessary that mining and transportation facilities be constructed well in advance of that date.

If NPPD cannot obtain coal from the Eastern Powder River Coal Basin and specifically the coal that was to be provided under our contract with Atlantic Richfield, it is certain that beginning in the year 1977 electric service to our customers will be compromised. The following table shows by year the peak deficiencies in power supply resources should Unit No. 1 be unable to operate due to lack of coal.

<u>Year</u>	<u>Surplus or (Deficiency)(MW)</u>
1976	(27)
1977	(432)
1978	(572)
1979	(565)
1980	(728)
1981	(884)

The immediate environmental and health impact on the public in our service area due to the curtailment of electric service to waste treatment, water purification facilities and irrigation projects would be disastrous.

Nebraska is a beef and grain exporting state. In 1973, Nebraska ranked third in the United States in the production of beef. Nebraska has approximately five million acres under irrigation with an additional five million

Mr. Daniel P. Baker
August 1, 1974
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acres scheduled for irrigation within the next ten years. NPPD supplies power for more than one-third of the present water pumps employed in irrigation. The shortage of oil and gas is causing an increasing conversion to electric power by other irrigators. An increasing number of new irrigation pumps will use electricity as the power source. Without electricity to power the irrigation pumps, the future food production capabilities will be critically diminished. This dependence on electricity must be considered in the evaluation of the impact of mining of coal.

NPPD is committed to a dependence upon the use of Wyoming coal. The inability of our suppliers to provide that coal will have a major impact on future food supplies.

Sincerely,



Eric N. Sloth, Ph.D.
Director of Environmental Affairs

ENS:dkb

BRUCE J. TERRIS
HELEN COHN NEEDHAM
SUELLEN T. KEINER
NATHALIE V. BLACK
ZONA F. HOSTETLER
ATTORNEYS AT LAW

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1908 SUNDERLAND PLACE, N.W.
WASHINGTON, D. C. 20036

(202) 785-1992

August 2, 1974

Mr. Daniel Baker
State Director
Bureau of Land Management
Box 1828
Cheyenne, Wyoming 82001

Re: Draft EIS on Eastern
Powder River Basin

Dear Mr. Baker:

The Sierra Club would like to take this opportunity to supplement its comments on the draft Environmental Impact Statement on Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming. The Sierra Club's initial comments have previously been submitted in the written statement and oral testimony by Ms. Laney Hicks, Northern Plains Representative for the Club.

In addition to the problems and deficiencies of the draft EIS as pointed out by Ms. Hicks, the Sierra Club is seriously concerned with the failure of the EIS to discuss or consider a number of critical alternatives and environmental impacts associated with development of the coal resources in the Eastern Powder River Basin.

First, the draft EIS does not adequately discuss the serious deficiencies in the quality of the coal reserves that would be extracted from the Basin. Those reserves consist of sub-bituminous coal and lignite which are capable of producing only relatively low amounts of heat (expressed in Btu's per pound) by comparison with the high Btu value of low-sulfur bituminous coal that can be extracted from other U.S. sources chiefly in central Appalachia.

Second, the draft EIS does not adequately discuss the cost of coal from western strip mines when delivered to the Middle West and East. Study has indicated that this coal is substantially higher in price than mid-western and eastern coal on the basis of cost. The BTU. Id., p. 18.

Third, the draft EIS does not adequately consider the availability of large amounts of low-sulfur coal in the East, particularly when the sulfur content is analyzed in relation to the Btu value of the coal. Studies have shown that "low sulfur coal in the Central Appalachian States has four times the energy potential of the reported strippable coal in the Northern Great Plains and New Mexico." Environmental Policy Center, Facts about Coal in the United States, (April 1974), p. 9. Furthermore, this low-sulfur Appalachian coal represents a large percentage of the available low-sulfur coal in the United States and the heat content or Btu value of Eastern coal has been calculated at 55% of the total U.S. coal reserves. Id. at p. 1.

Fourth, the draft EIS does not discuss why utilities are seeking to use the western coal, including the reserves in the Powder River Basin, despite its low quality, higher costs and the availability of eastern low-sulfur coal. It appears that the reasons for this shift include the ease of obtaining large blocks of coal reserves by leasing coal lands from the federal government and Indian tribes, the desire to avoid contracts with union coal miners, the less stringent reclamation laws and lower royalty payments for coal extracted from Indian lands, and the "fuel adjustment clause" in electric-rate structures which enable the utilities to pass through to customers all of their increased costs for western coal at a substantial profit and without rate-increase hearings before state utility commissions. Id., pp. 14-15.

Fifth, development of the Basin's coal reserves raises a serious problem with regard to utilization of stack-gas cleaning equipment in order to meet national air-quality standards. It has been shown that utilities in the Midwest and East could save money by using eastern coal, whatever its sulfur level, and installing sulfur-dioxide removal equipment on their stacks in order to meet air-quality standards. Id., pp. 15-16. However, utilities are ignoring the economic benefits from the use of eastern coal and instead are relying heavily on low-sulfur western coal in order to avoid installation of this stack-gas cleaning equipment. The environmental implications of the utilities' actions have been pointed out by a federal inter-agency task force (Final Report, Sulfur Oxide Control Technology Assessment Panel, Projected Utilization of Stack Gas Cleaning Systems by Electric Plants (1973), pp. 68-69):

The two low sulfur fuel alternatives [oil and coal] do appear more attractive to many utilities because they involve only small capital investments and shift the environmental protection strategy to an operating cost. In a number of states, utilities are now able to pass on to the

consumer most of the incremental operating costs of higher-priced fuels by means of "fuel adjustment" provisions. The fuel adjustment charges may be passed directly to the consumer via the monthly bill without further action by the regulatory commission. On the other hand, increases in generating costs due to carrying charges on or operating costs of capital equipment can be compensated only by rate increases which require commission action. Not only do the utilities claim that they must wait for this compensation until the regulatory commissions act but also they claim that they often have to "absorb" some of the additional costs, particularly from nonproductive equipment such as pollution abatement devices. This situation tends to force utilities to secure as much low sulfur fuel as is available and then wait to see what the Environmental Protection Agency or state agencies will do to enforce the standards. In this regard, it should also be pointed out that sulfur emissions tax would help only to the extent that it might force utilities to install stack gas scrubbers on those plants for which the utility could not secure low sulfur fuel.

While the probable dislocations in fuel supply resulting from these factors raise many questions, one of the most disturbing is the precipitous rush by the utilities to obtain low sulfur coal contracts and thus to show "good faith" in compliance insofar as the low sulfure coal is available. Vigorous utility competition for low sulfur coal from new and proposed mines in Wyoming and Montana has led to widespread speculation in land and water rights, particularly in the Powder River Basin. Much of the coal in this region lies under land whose surface rights are privately owned but whose mineral rights are either owned by the Federal government or Indian tribes. Few mines are operating today but many applications for leasing public mineral rights are pending and blocks of coal deposits owned by the railroad and other private interests, the states, and Indian tribes (off the reservations) are being unitized for exploitation. Acceptable reclamation of these semi-arid lands has yet to be demonstrated. The sudden surge for development of these resources finds both states and the responsible Federal agencies inadequately prepared to cope with the array of immediate problems presented by the development let alone

long-range cumulative effects on the economic, physical, and social environment of the region. Since stack gas cleaning represents a technological alternative in the near-term to such a culture-and environment-shattering resource development, the full implications of both options should be explored.

Sixth, there is no consideration of the effect on Appalachia and other economically depressed coal areas in the Midwest and East from the huge expansion of coal production in the West. Western coal development could result in additional unemployment in the Midwest and East or prevent, at the least, an increase in employment in areas of present high unemployment. Similarly, there is no consideration of the effect western coal development will have on eastern railroads which are already financially depressed.

Seventh, at a time when the United States is particularly concerned with attaining energy self-sufficiency and with reducing energy waste, the draft EIS does not consider serious losses of energy from the use of the large quantities of diesel fuel by the unit trains that will transport coal from the Powder River Basin to consumption points half way across the country. Fair analysis requires the deduction of the energy consumed in this transportation from the energy produced by the coal which is transported to obtain the net energy produced. Again, there are serious environmental and economic questions presented by the waste involved in this approach, as compared to the option of expanding utilization of coal reserves located closer to energy users in the East.

Eighth, the draft EIS does not consider the environmental injury which will or may be caused outside of the Powder River Basin by the transportation of western coal to the Midwest and East. For example, additional air pollution will be emitted throughout the railroad haul; new transportation facilities may be needed in other areas such as facilities for transfer of the coal to water carriers; and dredging or other activities may be required in navigable rivers. In short, it is essential that the total environmental impact of the proposed federal action be considered.

Ninth, there is no analysis of the environmental, economic and energy costs and benefits from conversion of the coal to electricity, to gas, or to liquid fuel in the Powder River Basin as contrasted to its conversion near the place where it will be consumed. Without such analysis, it is impossible to determine whether power plants, coal gasification plants,

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or coal liquefaction plants are proper in the area where their product will be consumed for outside the area.

Tenth, there is no critical analysis of the reclamation plans of the mining companies or railroads. Such an analysis requires an evaluation, based on past experience and scientific experiment, as to the likelihood that particular reclamation proposals will be successful at the particular site involved. While the draft EIS is honest in admitting in general terms doubt that reclamation can be successful, analysis of the particular soil, weather conditions, and reclamation proposals is also essential.

All these points need careful analysis. In addition, after the facts have been ascertained, careful comparison is required of the environmental and economic costs of various alternatives against the benefits to be obtained. Then, the results of this balancing need to be compared for the various alternatives to ascertain the action which is most advantageous from the standpoint of the environment, energy supply and economic cost.

Sincerely yours,



Bruce J. Terris
Attorney for the Sierra Club

BJT:eb

FEDERAL POWER COMMISSION
WASHINGTON, D.C. 20426

JUL 31 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
U. S. Department of the Interior
EIS Team
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

This is in response to your letter requesting comments on the Department of the Interior's Draft Environmental Impact Statement related to the Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming.

These comments by the Federal Power Commission's Bureau of Power staff are made in compliance with the National Environmental Policy Act of 1969 and the August 1, 1973, Guidelines of the Council on Environmental Quality, and are directed to the need for development of some 12.4 billion tons of coal reserves located on 370,000 acres in Campbell and Converse Counties in the State of Wyoming for use in electric power generation.

The draft environmental statement was prepared by an Inter-Agency Team representing the Department of the Interior's Bureau of Land Management and Geological Survey, the Department of Agriculture's Forest Service, and the Interstate Commerce Commission. The statement analyzes the environmental impact of development to 1990 of the area coal resources, including associated transportation facilities, by opening four surface coal mines to be located on public land and privately owned land on which underground mineral rights were retained by the Federal Government. Approximately 42 leases on tracts totaling 93,075 acres have been granted, and approximately 44 additional preference-right lease applications on tracts totaling 96,517 acres are pending award. Twenty-two companies are involved in the development of these coal resources, located in the East Powder River Coal Basin, which contains about 75 percent of the coal reserves of the Northern Great Plains.

Mr. Daniel P. Baker

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The coal to be mined by 1990 is estimated to total about 1,543 million tons, of which some 1,170 million tons, or 76 percent, will be exported from the area for use principally for electric power generation in the midwestern and southcentral United States. The remainder will be used locally in existing electric generating plants and in proposed coal gasification plants. Industrial projections for the East Powder River area are limited to exploration and development of mineral resources.

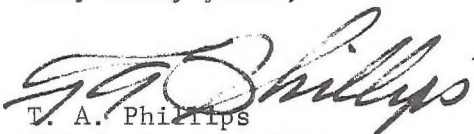
Pacific Power and Light Company has reported to this Commission that it plans to place in operation by May 1977 a 330-megawatt coal-fired unit, Wyodak No. 1, in the Eastern Powder River Basin. The construction of additional coal-fired plants in that area in the 1984-1993 decade is probable.

The principal portion of coal mined in the Basin is indicated to be exported by rail to Nebraska, Oklahoma, Texas, Arkansas, Louisiana, and Indiana. Purchase contracts have been signed with the Arkansas Power and Light Company, Central Louisiana Electric Company, Gulf States Utilities, and Indiana and Michigan Electric Company for deliveries to begin in 1977. The staff notes that the construction of generating facilities to utilize western coals can contribute toward the adequacy of electric power supply and provide other attendant benefits as a supplement to present use of high sulfur eastern coals, natural gas, and fuel oil. The curtailment of the use of natural gas as a boiler fuel for electric power generation, the enforcement of air quality standards, the difficulties encountered in present nuclear generating programs, and the national goal of energy independence from foreign oil supplies strongly suggest further development and increased use of domestic low sulfur coals located in the western United States.

The Bureau of Power staff notes that the subject development includes an area which is a part of Interior's Northern Great Plains Resources Program, an ongoing study, and which includes some detail on the use of these coal resources for the generation of electric energy.

The Bureau of Power staff concludes that the proposed development of the extensive coal reserves of the Eastern Powder River Coal Basin is a reasonable measure to insure an adequate supply of low sulfur coal for the electric utility industry and, consequently, contributes toward the adequacy and reliability of electric bulk power systems.

Very truly yours,


T. A. Phillips
Chief, Bureau of Power

VII-703

A SCIENTIFIC AND POLICY REVIEW
OF THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT
ON THE
DEVELOPMENT OF COAL RESOURCES
IN THE
EASTERN POWDER RIVER COAL BASIN
OF WYOMING

Submitted to the Department of Interior
by the
Environmental Impact Assessment Project
of
The Institute of Ecology

Edited by
Catherine Lochner

August 2, 1974

VII-704

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The Environmental Impact Assessment Project, which has issued this review, was approved by the Board of Trustees of The Institute of Ecology (TIE) and is supported by a grant from the Ford Foundation. This Project was established to help improve the content and the utility of federal agency environmental impact statements prepared pursuant to the National Environmental Policy Act (NEPA).

The members of this review team were selected by the Project staff and were chosen for recognized professional competence and with due consideration for the balance of disciplines appropriate to this review. Responsibility for the detailed aspects of this review rests with the review team members and with the Project staff.

Each document prepared by this Project is further reviewed by one or more qualified individuals according to procedures established by the Director of The Institute of Ecology. Distribution of the document is approved by the TIE Director upon satisfactory completion of the review process.

Final review of the document which follows has not yet been completed by The Institute of Ecology, and it should therefore be considered as a draft subject to possible revision.

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I. INTRODUCTION

The Environmental Impact Assessment Project of The Institute of ecology was established in July, 1973 to help improve the substance and utility of federal environmental impact statements prepared in accordance with the National Environmental Policy Act (NEPA) and the guidelines of the Council on Environmental Quality (CEQ).

In pursuit of that goal the Project selects and assembles interdisciplinary teams of scientists and other experts capable of assessing the organization and content of specific environmental impact statements chosen for review.

In choosing statements for review the Project focuses on proposed federal actions where the environmental impacts of the proposed project are likely to be significant enough that the agency decisionmakers would be receptive to, and would benefit from, an additional external substantive review.

Accordingly, we have chosen to review this draft environmental impact statement (EIS) prepared by the Bureau of Land Management, the United States Forest Service, the United States Geological Survey, and the Interstate Commerce Commission on the Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming. This review reflects the coordinated effort of recognized experts in a number of fields who are concerned with the impacts which may result from the developments outlined in the EIS.

This review is an attempt to offer constructive input into the agencies' environmental impact analysis. Generally, such a critique is used in revisions for a final impact statement.

However, the Project review team believes that gaps and inconsistencies of such significance emerged in the process of review that the information and recommendations presented should be used in a revision of this draft statement before a final statement is prepared.

Members of the Project review team wish to make it clear that the criticisms contained in this document should not be construed as criticism of the capabilities or intentions of those people who prepared the EIS. On the contrary, given the unrealistic time schedule which was forced on them by Federal decisionmakers, the preparers of the EIS did a commendable job. Hastening the impact statement review process raises significant problems -- both for individuals, organizations and state agencies who seek to have some input into the decision making process, and for federal officials, who must respond to substantial criticism of incomplete, inadequate environmental impact statements.

II. FRAMEWORK FOR THE REVIEW

A. NEPA

The draft environmental impact statement has been prepared to comply with the National Environmental Policy Act of 1970 (NEPA). This Act declared national policy objectives to "encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation..."

The Act goes on to declare the following national environmental policy:

(a) "The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment... and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with the State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." (NEPA, Section 101. (a))

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations

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of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may:

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
- (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment."

B. The Impact Statement in the NEPA Context

While NEPA specifies that the EIS must consider long run implications, the EIS does not consider impacts beyond 1990. In terms of a regional perspective, there is no way to cut off analysis by a very arbitrary date, thus excluding consideration of future generations. After 1990, what will be the uses of the land, future life styles, and the quality of the environment in which people of this region be expected to live? This is particularly significant in view of the fact that coal development often follows a boom-and-bust cycle, predicted by an Interior Coal R & D Task Force study to occur with western coal by the turn of the century.

Basic to the management policies of the Bureau of Land Management, the U.S. Forest Service, and to NEPA, is the multiple

use philosophy. We find an absence of this philosophy and planning objective in the document. The statement describes the impact of coal on existing uses which has the effect of presenting a bias toward a single resource use, coal, thus deemphasizing agriculture and other multiple uses in the region. The final EIS should recognize the existing, renewable uses present in the region, with coal development analyzed insofar as it could be made compatible with these uses. This would maximize and enhance beneficial uses and renewable resources of the region without degradation of the environment.

The Project finds a very narrow interpretation of historic, cultural, and natural aspects of our national heritage characteristic of the Powder River Basin EIS. Archaeological resources do receive consideration as historically important, but the present cultural and natural aspects are almost completely ignored.

The people who live in the region and produce from the land are a living system and a unique part of our heritage. The wildlife and water interrelationships are also an integral part of the total system in this region. The statement generally shows a lack of recognition for the value of these systems and ignores the planning measures and standards which should be enforced to maintain the existing interrelated systems and inherent productivity of the region.

Finally, this region should not bear the disproportionate economic and ecological costs of supplying other regions' energy demand. The statement fails to articulate the real costs to the present residents of the region in terms either of dollars or degradation to the environment. Based on experience in states to the south, there is room for considerable concern, especially

when related to sparsely populated areas such as the Powder River region. Citing national energy demands as an excuse for regional development with little discussion of alternatives down-plays the importance of this region and tends to encourage the raising of living standards in the rest of the country while depressing them in this region.

III. GENERAL CONCLUSIONS

Under Section 102 (c) of NEPA, agencies of the Federal government shall, "include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official..." These statements include environmental impact, effects which cannot be avoided, alternatives, relationship between short-term uses and maintenance and enhancement of long-term productivity, and irreversible and irretrievable commitments.

The Project's review of this EIS has been guided by the intent and requirements of both Sections 101 and 102 of NEPA. Our comments and recommendations are based on our assessment of how well the document fulfills these requirements.

Many of the basic concepts of Section 101 and requirements of Section 102 have not been researched, analyzed or presented in an understandable form. The magnitude of the statement's deficiencies has led the Project team to conclude that compilation of a meaningful final statement is not possible at this time. This EIS should be completely revised. The most important deficiencies follow in the discussion below in the topic reviews.

Several comments pertaining to the entire EIS which should be given emphasis are summarized here. These comments concern direction and content of much of the EIS, and are important in light of our basic conclusion that this draft should be revised before the final statement.

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A. Eastern Powder River Basin Coal -- Federal Coal Leasing Policy

Neither the national energy situation nor the national coal picture is as simple as this draft EIS would indicate. As is readily apparent (in this EIS as well as in the current draft EIS on federal coal leasing), the BLM, USFS, USGS and ICC have completely absorbed the "conventional," but not necessarily correct, line of reasoning concerning the inevitability, desirability and necessity of large-scale western coal development. The fact that many options exist for the nation concerning coal development has completely escaped the authors of this EIS.

Significantly, this draft EIS comes at a time when federal coal policy is being widely debated -- in the Department of the Interior, in Congress, and among the public. Indeed, shortly before the issuance of this EIS, the Department of Interior released its draft programmatic EIS on federal coal leasing. In addition, Congress is entering the final stages of debate on the regulation of coal strip mining. The public harbors a variety of concerns -- from worry over the potential impacts of rapid western coal development, to concern that the coal industry appears to be abandoning the eastern mines, to confusion over the "energy crisis" and "Project Independence" policy moves at every level of government.

In view of such far-reaching and important pending coal policy considerations, it is surprising that this EIS was written in a virtual vacuum. Nothing less than the future of federal coal management and the rules under which coal strip mining can occur are at stake. Yet this EIS deals with the development of Wyoming's Powder River Basin as if this were unrelated to such policy matters. One wonders whether the haste with which the developments considered

here are hoped by the proponents to be approved is in part an attempt to avoid the further scrutiny and/or the changing laws and policies which will surely come.

The EIS contains at least some allusion to the fact that federal coal management has been less than adequate in the past. Although the statistics concerning coal reserves are hopelessly out-of-date (I-22), the message that potential federal coal development is enormous comes through loud and clear (I-21). In particular, the existence of large numbers of outstanding prospecting permits demonstrates the extremely precarious point to which the Department of Interior has led the public and its resources (I-21). (Prospecting permits were for many years issued for coal "exploration" in the areas of thickest and best-known strippable coal deposits in Wyoming; "finding" coal allows the company to obtain a preference right lease, without competitive bidding.)

Unfortunately, neither this EIS nor the current draft EIS on federal coal leasing can reassure the public that the ills of past coal management will ever be corrected.

Taken together, the draft EIS's on coal development in the Powder River Basin and on federal coal leasing in general present graphically the Interior Department's unwillingness to objectively assess federal coal development problems, and further, to allow environmental factors to enter into the realm of decision making. In addition, and of perhaps even greater national significance, is the fact that in neither EIS is non-federal, non-western coal considered in relation to the no-holds-barred approach to western coal development advocated by the industry, the Department of the Interior, the USFS, and the ICC.

Interestingly enough, some people within the Department of Interior have been pondering the broad implications of policies such as are unquestioningly accepted in this EIS. In an unpublished "Project Independence" report of the Department's Coal R & D Task Force, it was concluded that rapid large-scale promotion of western strip mine development would before the end of the century deplete most of the strippable deposits, cause the atrophy of the deep-mine industry (the health of which is essential to long-term coal development), create disruption in the financing of coal mines, and leave the coal industry in shambles. This serious possibility leaves the EIS under consideration here even more pitifully inadequate.

B. Regional Analysis

The approach of the statement is to present a regional analysis and specific proposals; yet, there is no thread of consistency and relationship between the two approaches. The statement fails to satisfy either regional analysis or specific site evaluation.

This Project does not understand or agree with the first assumption of an "East Powder River Coal Basin." The Powder River Basin is a hydrologic basin and includes most of northeast Wyoming. A regional analysis of coal development based on coal resource definitions would cover a three-state area. If the immediate off-site impacts were included, the area covered would be the five states included in the Northern Great Plains Resources Program. The regional analysis concept as it is used in the EIS appears to be more a political tool than an analysis area. For example, an impression of minimal impact is created by using a reference base covering a large area of the region and then

giving a low percentage figure for the actual impact area. This has the effect of directing the conclusions the reader will make toward a certain decision and it is not an objective weighing of impacts or alternatives. Unless the agencies have predetermined what decision they want, there is no reason to weight the presentations toward an implied acceptable trade-off. The most glaring examples of this "minimizing impacts pattern" as just described occurs with regard to the amount of pollution and impact on air quality, the importance of agriculture, and the availability of water.

Evidently the concept of a regional analysis has not been clearly understood or defined in compiling the EIS. In fact, is arbitrary and inconsistent from one section to the next for a single resource. This same inconsistency is also present between the general description of the environment, impacts, mitigation and so on. In the regional analysis, the reader is never quite sure what area or number reference (plants, mines, reservoirs, etc.) is being used from one page to the next. Aggravating this problem is the constant shifting in measurement units, and apparent transposition of figures and tables that do not correspond with the text. Specific examples of each of these problems are presented in the discipline by discipline critiques presented below.

A major objection to the analysis of accumulated regional impacts section is the fragmented way in which it is presented. This results, no doubt, from our traditionally fragmented manner of resource management in general. But it would be hoped that a more integrated approach will be attempted in a revision of this draft, with use of summaries and a concise presentation of major adverse impacts and anticipated effects on existing landscapes, in order

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to facilitate an accurate appraisal of the total costs and benefits of probable courses of action.

C. Adequacy of Data

An environmental impact statement depends on the most accurate predictions possible. An underestimation of impacts could set a program of development moving that cannot be stopped, even though it should never have been allowed to begin. Making such predictions is very difficult and it would seem crucial that the mechanisms and data base for making these predictions be clearly described, for otherwise the EIS is a purely academic exercise. Little confidence can be given to the reliability of predictions made in this EIS and thus little confidence can be placed in predictions of impact. Before evaluating any EIS, one must know something about how the predictions were made and whether they are accurate.

Related to this problem of accuracy of prediction is the apparently narrow information base from which the EIS was developed. The NGPRP is widely known as an on-going evaluation of resource development over the entire Northern Great Plains. It seems incredible that this information was not used extensively. The International Biological Program, Grassland Biome Project in the Pawnee National Grassland in northeastern Colorado should also have been used. This project has been studying the grassland ecosystem for six years, during which time over 250 technical reports and numerous publications have been prepared, including the development of a mathematical simulation model (ELM) to ascertain the effects of various perturbations on the grassland environment. It seems strange that this study, supported by the National Science Foundation, is not even referred to in this five-volume

EIS. Certainly this is a prime source of material on an environment similar to that of the Powder River Basin from which baseline data could have been derived. These are just two examples of extensive sources of information which could have been used to fill in the many gaps in this EIS, and which would have made several evaluations of impacts possible and more credible if they had been used.

As well as omitting several sources of information, the EIS does not present or assess the scope and magnitude of various impacts. First of all, much of what needs to be known in critical areas is not included. Data is lacking, conflicting, or not presented in an intelligible perspective. It is not clear what changes will occur to air, land, and water from the proposed single or regional developments.

To illustrate in a general manner what is meant, the impact of various activities is considered on vegetation, wildlife, aesthetics, etc., but no attention is given to the effect of the spatial distribution or time sequencing of these activities. Consider an area with a railroad track, a mine, a power plant, and a town. One spatial arrangement of these components might lead to greater environmental impact than another. Perhaps a river and an elk winter range should have been included as components in the hypothetical example. At the very least it would have been desirable to specify the distances between the components necessary to mitigate adverse impacts. The necessity of calculating the proportion of the whole area that will be strip mined is made elsewhere. A figure of 14,000 acres is large, and such an area must be considered for its own value, but the impact is placed

into another, broader perspective if readers know whether it is 14,000 acres out of 20,000 or out of 500,000. Also important is the location and distribution of this acreage -- what proportion is alluvial flood plain, rare ecosystems, etc. On page III-170 the statement is made "Strip mining and associated activities will eliminate a portion of this life-support community which is the major irreversible impact to wildlife in the area." If we are to evaluate the impact, we must know what proportion of the life-support community will be eliminated. The timing of events, either natural or man-caused, should also have been considered more in the impact statement. More consideration of timing, as mentioned in the review of socio-economic factors, would have facilitated evaluation of a community's ability to deal with impending impacts. Greater consideration of the spatial distribution and timing of happenings would have rendered the EIS more realistic.

Finally, the information presentation is confusing. On the one hand, the EIS presents very technical information which is neither interpreted nor related in many cases to the immediate discussion or other sections of the statement. On the other hand, generalities and vague statements of intent are presented without documentation.

D. Adequacy of Environmental Regulation

The mitigation section of the EIS has received a narrow interpretation. It appears to make the general assumption that existing federal and state laws and regulations are the measure of what is acceptable and that those standards are the only ones available to the agencies. There is no presentation of the environmental controls written into the existing leases or the

lack thereof. There is no recognition that existing laws are scattered and cover only portions of the impact and that using federal standards may degrade environmental quality instead of maintaining or improving it. Certainly the thrust of NEPA is to forestall environmental destruction rather than being aimed merely at those areas which are already degraded and in need of improvement. The level of information contained in the EIS indicates that responsible agencies do not have sufficient knowledge to set standards levels for a quality environment or to assure that these standards levels will be met through proper and detailed stipulations.

E. Public Hearings

It is our opinion that at the time of public hearings, the commenting groups did not have available to them critical information which would have been the basis for much more reasonable and intelligent input. Some of this information was available but not used in the EIS; some critical research still needs to be done, and what was included in the statement is conflicting and confusing. Furthermore, the review time prior to public hearings did not allow technical experts sufficient time to review the document and prepare comments. The public hearings were not a full measure of what the public could and can produce. Because public input is part of the decision-making process and because this input should be more than a superficial evaluation, which it could only have been on the first round, there should be public hearings again following the rewrite of this draft.

F. Moratorium

Moreover, because of the many enumerated research gaps presented below in this review, it seems reasonable that there should

be at least a two to five year moratorium on any decisions. This time period would allow time to prove or disprove some of the generalizations set forth in the draft, and time necessary to analyze critical areas which at this time lack research and documentation.

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IV. DISCIPLINARY REVIEWS

A. Review of Climate and Air Quality

The importance of the extremes in precipitation is not properly emphasized. For example, the mean annual precipitation is about 12", but this is because there are a few extremely wet years. The precipitation distribution is skewed such that about 1/2 of the years receive less than 10" of total precipitation. At the opposite end of the spectrum, but equally important, is that most of the precipitation occurs from either a few heavy winter blizzards and/or a few severe thunderstorms. The hazards associated with blizzards are blowing snow, rapid drops in temperature and extreme cold. The hazards associated with severe thunderstorms are lightning, hail, flash floods and hurricane-force winds. These hazards are magnified in impacted areas in which temporary structures predominate.

The draft EIS cites an EPA study which indicates that 15 potential pollution episodes lasting at least 2 days can be expected over the Basin each year. A potential pollution episode is a day in which an inversion exists near the surface. The EPA study was based on routine National Weather Service atmospheric soundings at Rapid City, Scottsbluff, Denver and Lander. These soundings are quite unrepresentative of the atmospheric boundary layer in the vicinity of the Bighorn Mountains. Observations conducted by the University of Wyoming rather suggest that there will be one episode lasting at least 6 months each year. There is a persistent inversion over the area during the winter from cold air which drains across the low altitude continental divide near

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Rawlins. This cold air accelerates producing the strong, persistent winds in Casper and then spreads across the Basin. When the Rawlins air is not producing an inversion, arctic air masses with cold north winds spread over the area and also produce a low inversion.

The atmospheric boundary layer is critically important in air quality. Since the mountains strongly affect the atmospheric boundary layer, it must be studied in detail, and it cannot be interpolated from existing National Weather Service data. The emissions from the Dave Johnson Power Plant near Glenrock, Wyoming are significantly deteriorating the air quality along the North Platte River. Before any more power plants are allowed to come on line, we must understand the possible effects of such actions.

An example of the connection between the unique boundary layer which exists over eastern Wyoming during the winter and air pollution is given in Figures 1 and 2. Figure 1 is a vertical temperature profile taken along a north-south line through Douglas on 6 December 1973. Note the well-defined inversion at about 800 feet above ground level. As is common for this area, the inversion persisted for several days and did not break. Figure 2 is a plot of the vertical temperature distribution and horizontal wind profile. Again, it may be noted that the atmosphere is stably stratified. The unique characteristic of the boundary layer is demonstrated in Figure 2. The winds at the surface are about 20 mph while the winds at 400 feet exceed 60 mph. Typical low level jets associated with inversions occur above the inversion. Since the boundary layer is stably stratified and over a sloping terrain, it is believed that in such a case the cold, dense air

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below the inversion accelerated the most, thereby producing the unique low level jet below the inversion.

Serious consideration must be given to the possibility of inadvertent weather modification caused by excess human activity in the semiarid region. In India the evidence indicates that a desert has been caused by nomads who overgrazed the land. Dust rose in the atmosphere and acted as a black body. Solar radiation was absorbed by the dust (black body) rather than at the earth's surface (Bryson, 1972). When the atmosphere is heated from below, it becomes unstable and convective clouds form (similar to boiling of water) and causes summer rain. When the atmosphere is heated in the mid levels, the atmosphere is stabilized and a drought ensues. This has happened twice in India. It now seems to be happening along the southern edge of the Sahara Desert in Africa where well-intentioned government policies resulted in an excess population of cows and people. In 1968 a routine drought began. Since the area was over-populated and the new government policies did not allow the natives to react in their normal manner (leave the area as nomads), the land was denuded, dust levels increased and now, possibly, an irreversible drought exists. Respectable scientists have speculated that in the United States the dust bowl in the 30's was at least aggravated (if not caused) by the excess homesteading of the 20's. The Thunder Basin National Grasslands were acquired by the federal government to keep this area from being plowed and dust bowl conditions encroaching.

Northeast Wyoming is a semiarid region and as such the climate is delicately balanced and can be upset by excess strip mining,

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power plants, roads, railroads, power lines, etc. It would be ironic if we significantly reduced the food supply in the process of solving the energy "problem."

Additional criticisms of the treatment of air quality, with some discussion of mitigative measures, follows.

In Volume II (I-461) there is included a section on Probable Cumulative Regional Impacts on Air Quality. This section deals almost entirely with stack emissions produced by coal burning electric generating plants. While amounts of particulate matter as well as amounts of sulfur dioxide and nitrogen oxides for different power plants, are noted (p. I-647), no reference is made of specific effects of these emissions on agricultural flora.

Additionally what is needed is an amendment to the State Air Quality law which requires that not only the amount of allowable particulate matter be delineated but also the composition of that particulate matter. It is extremely critical that the components of particulate matter be recognized so that any changes which appear in biological systems can be correlated with specific chemicals in the air.

At present, the Wyoming Air Quality Regulations require only that not more than a certain amount of particulate matter be released into the air. Unfortunately, many of the particulate collectors are located along dirt roads and this results in heavy concentrations of road dust in these collectors. It should be required that particulate trapping devices be located away from dirt roads and on the same sites from which biological information is being collected. Additionally, there is a definite need to delineate the composition of material which appears in particu-

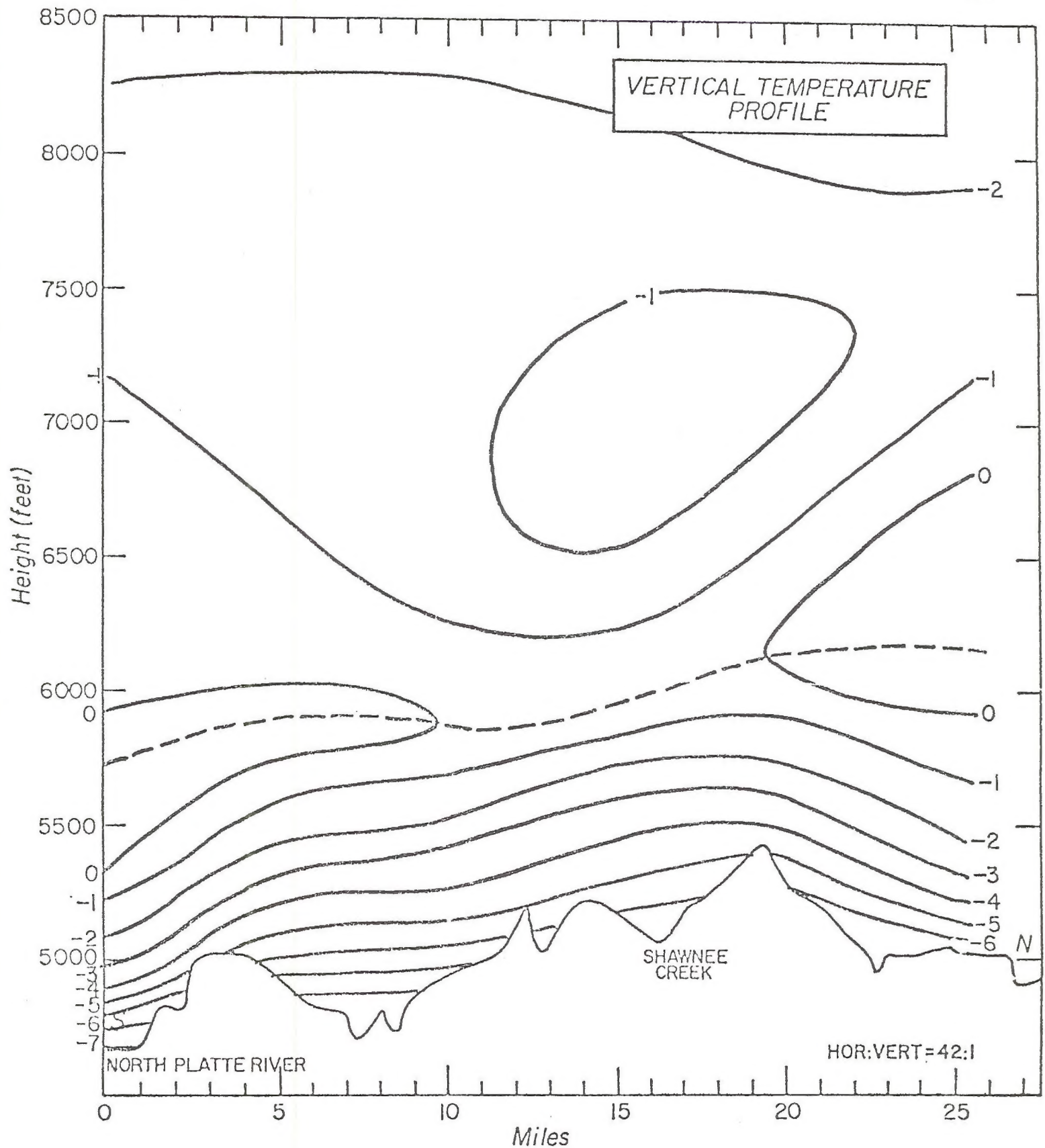
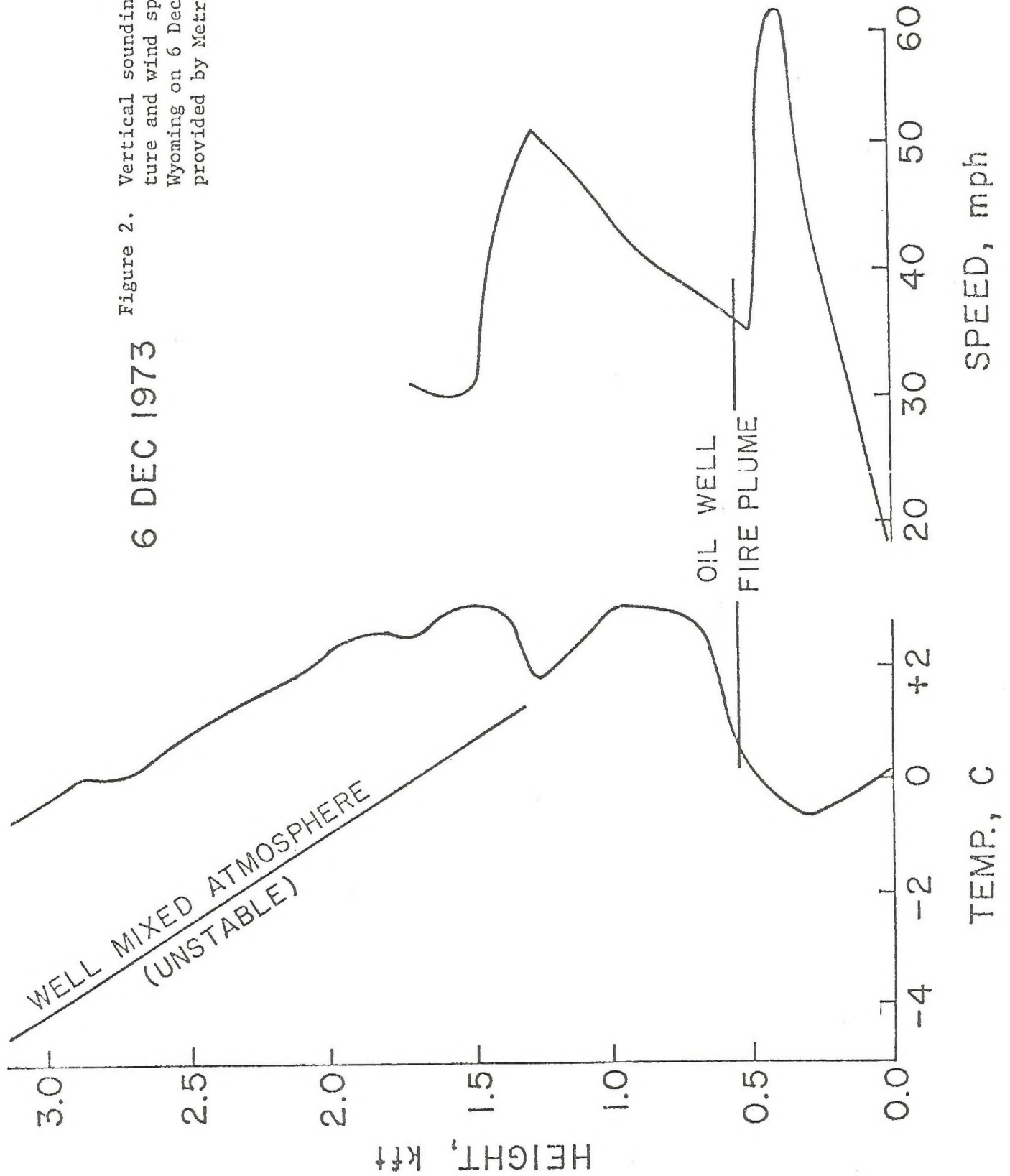


Figure 1. Douglas site temperature cross section, 6 December 1973, morning (0800-1000) with southwesterly winds. Temperature is in degrees Centigrade. Dashed line represents top of stable layer. (Data provided by Metronics, Inc., California).

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Figure 2. Vertical sounding of temperature and wind speed near Glenrock, Wyoming on 6 Dec 1973. (Wind data provided by Metronics, Inc.)



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late collecting devices set up to determine the effect of stack emissions. This is important for two reasons: 1) Unless the material is delineated, we have no handle on the extent of the distance travelled by stack emissions and cannot state definitely that they have an effect on biological systems. 2) We are unable to differentiate between emissions from power plants and those from other sources. The above mentioned changes are needed in order to properly enforce Wyoming's Air Quality Laws.

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B. Soils

The soils data is misleading and inadequate. The area soil association map (Map 7, Appendix) is too vague and generalized to give any more than a very cursory overview of the study area. A more detailed and comprehensive map is needed for planning and assessment.

The study area is reported to contain 4,978,560 acres (p. I-16). The total acreage of the 21 area soil associations contains only 4,668,780 acres. This is a difference in excess of six percent of the total. It is not clear whether the missing six percent are included in lands listed as "miscellaneous areas" unable to be classified. If so, Map 7 shows no gaps for the unclassified areas.

Although considerable agricultural soil-survey type of soils information is presented, we still do not know of the subsurface mineralogy, soil depths, and degree of zonation. These are critical to assessing probability of reclamation and methodologies for soil stockpiling and rehabilitation. The regional soils map in the Appendix permits the following notation:

Of the coal mine areas outlined on appendix maps; only a few of the loosely-mapped soil associations are to be involved in rehabilitation efforts and mining disturbance. These are:

- Unit #1 - about 5% of the mine areas
- Unit #3 - about 40% of the mine areas
- Unit #7 - about 15% of the mine areas
- Unit #8 - about 10% of the mine areas
- Unit #11 - about 30% of the mine areas

Of these, 55% are highly erodable by fluvial processes (running water) and an additional 5% by wind. The remaining 40% are all

classed as of moderate to high fluvial erosion hazard. The 5% wind-erodable are noted to be within floodplains or subject to periodic flooding. Unit #11 has high shrink-swell hazard. Most have low permeability and are all of varying thicknesses. What all this means is that the present data suggest that the handling of the soils to be directly impacted by mining must be quite different than is suggested in the EIS. The soils to be impacted are delicate and must maintain their cover if they are to be kept out of the watercourses. They are not conventionally irrigable once soil structures are destroyed by stripping and stockpiling.

The EIS implies that soil formation will begin again once mining has ceased and reclamation has been completed(p. I-651). This may be true in only an academic sense. Probably the most critical factor in initiating pedogenesis on the spoils piles will be vegetation. Without adequate plant cover, wind and water erosion may be sufficient to maintain the spoils piles as rubble. It is questionable whether sufficient water is naturally available for adequate revegetation.

We still have not been given any indication of the geologic history of the soils units. We do not know how old the soils are or how immature they may be, except as can be derived by first-hand knowledge of the soil association units. The surficial geologic information is not geomorphic. That is, it does not tell the reader how that landform and its associated soil and vegetation was formed and one cannot, therefore, know how it will behave when disturbed and recontoured. Lack of sensitivity to the problems of rehabilitation is evident in the quality of soils data presented. Most was just drawn from existing agricultural sources

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and is of very little help for strip-mine reclamation analyses. The soils information therefore does not lead to information on reclaimability. One should have percentages of vegetative cover and kinds of vegetative covers as a function of soil unit, soil mineralogy, and soil depth and texture. These should be superimposed on a landform map showing soils actively forming, accumulating, or eroding so that past and future impacts can be assessed. The work is easy to do and could have occupied 3 man-months at the mine sites to get adequate information.

The lives of the mines (p. III-103) in some cases are set at 74 years. However, the probably cumulative impacts have been assessed only to 1990 (16 years).

In this EIS we are given some long-needed information on climatology that could be coupled with adequate soils data to give an honest assessment of reclamation potential. First, the EIS does have an implicit definition of what its writers seem to feel is a reasonable goal or definition of reclamation. Thus, on page I-80, "Land will be reclaimed to a terrain compatible with present topography and planted to provide soil stability and re-establish a viable land use," and again, "Reclamation objectives are to return the land to a realistically attainable land use." Whether a 'viable land use' is necessarily 'realistically attainable' is subject to considerable discussion; but we at least have something to build upon here. If viable means in perpetuity, then it must be a natural functioning ecosystem adapted to local conditions and variations.

The quote that the EIS includes from the National Academy study is interesting. It says in part that "This (adequate rainfall

for vegetation establishment) has been demonstrated in range-land seeding projects through this region. Predicting such results assumes that the best technology will be applied, including the addition of topsoil and selective sorting of spoils to avoid placement of clays and toxic substances on or near the surface." Nowhere, however, is such a handling procedure specified in the EIS. There is nothing about selective sorting; on the contrary, large earthmoving equipment is to be used on the 5-60" soil layers indiscriminantly for collection of the soil.

The EIS (P. I-79) does concede the important fact that disruption of soil structure and accompanying loss of fertility preclude re-establishment of near climax types of species or cover. It does not say how they conclude what such climax conditions may be nor, even if they exist at all in undisturbed sites; as probably they do not given the pedologic immaturity of the area.

The climatic data presented in this EIS suggest that the 10" mean annual precipitation figure of the National Academy means little. The precipitation to evapotranspiration data given (P-PET) on p. 1-124-5 and table 9 of appendix C, reveals that there is a considerable moisture deficit during the growing season. All moisture that falls on the ground during the growing season is consumed by plants or evaporates under undisturbed conditions. An additional amount of winter moisture is also consumed. No excess water is available in the top 6" of soil to recharge aquifers at the end of the growing season. Actual evapotranspiration is almost twice precipitation for a year and is three times the precipitation during the growing season. This all means that there

is a moisture deficit and that plants exist in rangeland conditions by their ability to augment the ability of natural soils to trap and store moisture. Artificially built soils do not have such abilities. If devegetated but not stockpiled, as in farmland succession, soils become more dense, resist percolation by water, and have higher bulk densities and support less groundcover until the very slow process of plant succession permits roots to reach progressively greater depths and to accumulate organic matter at these depths. Such plant succession is evident in the work of Lee Lang quoted in the EIS (I-505-507). Even this work was selectively misquoted in that his 1940's thesis states that 50 years would see recovery but his 1973 work showed that to be quite wrong.

This work is not applicable to coal-mined land reclamation, primarily because in the farmland situation, the soil layers are not as thoroughly mixed as they are in the strip-mine stockpiling situation. Thus, subsoil structure is retained as is some soil zonation in the farms and "all" that has to be done is to restore the lower bulk densities of the soil and thus, improve its absorption of water and storage of same. "Viable" land use reclamation means that soil zonation must be restored by natural processes if not prescribed in the mining plans. These processes will take thousands of years at least.

The "50% loss in productivity" conclusion of the EIS may be interpreted as based on the farmland reseeding experiments and studies typified by Figure 6 (I-506). This follows from Lang's 1973 observations of build-up and decline of cover 45 years after farmland abandonment (C-41) in which present cover is but 43%

of that on adjacent 'undisturbed' lands. This figure cannot be supported since it is not based upon reclaimed mined lands but it may be a ballpark guess that is better than nothing.

However, please note that by 1990 a total of 8,900 acres are to be permanently lost to vegetative cover (I-504) or 31 percent of the total disturbed by then. The 50 percent reduction figure is for productivity of the remaining potentially reclaimable land. Another way of looking at this is to say that only 34 percent of the disturbed land is to be brought back into a semblance of predisturbed productivity after 50 years ($.50 \times (29000 - 89000)$).

There is absolutely no basis for proposing that there will be an increase, not decrease, in land productivity except during that implied 5-year period of stewardship through fertilization, irrigation, and reseedling during which 'reclamation is ongoing.' The Wyoming agricultural people may have data to show that cover and total productivity are increased after deep ploughing or spreading of reclamation spoils with fertilization and watering. It is reasonable since the soil nutrient storage balance has been destroyed; but such is of very limited duration and ultimately results in very sterile conditions.

There is no basis for the idea of 4,036 acres of "rehabilitated" land in the 5 years from 1980 to 1985. Lang's charts do not support it, and it is the only data presented. Ninety-two percent of the acreage to be disturbed is dominated by sage (I-505) which could not be expected to recover to even 10% of its original cover after 5 years.

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C. Geochemistry: Mineral and Trace Elements

1. Description of the Existing Environment

a. Considerable potentially harmful trace elements are noted in the inadequate chemical analyses provided in the EIS and the conclusions of the EIS do not follow from the data presented. Particular care must be taken with molybdenum, selenium, mercury and fluorine. The data provided does not permit calculation of aggregate averages for the total coal to be burned in various areas or various plants; therefore airshed modeling and dispersion is not possible except using hypothetical figures, from which true impacts cannot be derived. Also, fluorine values given suggest high potential fluorine pollution in downwind grazing areas, with associated fluoridosis poisoning. Perennial grasslands and conifers are much more susceptible to fluorine build-up than area broadleaved trees in the East, so little comparative coal-fired power generation experience is available on this problem in the West.

b. Using the EIS figures for fluorine concentrations (with a simple average of 57 ppm for all samples listed on p. I-77) and noting that a cumulative total of 373 million tons of coal are to be consumed within the basin, which is but a small fraction of the cumulative totals expected by the year 2000 (I-33; 285.7 million tons/year total production); we calculate that about 21,261 tons of fluorine may potentially accumulate in the basin from mine-mouth and nearby power plants. Over a 15 year period, this amounts to an annual production of fluorine of about 1417 tons or more than three times the peak annual fluorine output of Anaconda Aluminum Company of Columbia Falls, Montana, with its very well-documented fluoride injury to 15,200 acres around that plant. (See TIE Review

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of Crow Ceded Area, p. 34-35). Coupled with SO_x discharges, these emissions should have very considerable impact on the southeastern half of the Powder River Basin and will impact grazing of cattle as fluorine accumulates in the forbs. If the values of 200 ppm fluorine reported for one sample are more typical than the inadequate EIS data suggest, the fluorine contents of Atlantic Richfield and Carter Oil coal holdings (Vols. III and IV) suggest average concentrations in excess of 100 ppm, so fluorine outputs from burning that coal would be double those of our conservative model developed here.

c. Exception is taken to the statement (p. III-12), "Preliminary tests indicate the overburden does not contain any toxic materials." The EIS (p. III-45) indicates potential problems with respect to boron and lead; other analyses presented in Table I have shown local high concentrations of molybdenum, beryllium, and cadmium; and botanical research has reported the presence of selenium converter plants, indicating a possible selenium problem. The local high concentrations of these elements appear quite sporadic in occurrence. More analyses of the overburden should be made, so that areas with high concentrations of toxic elements can be located, and measures can be taken to prevent these elements from being released to the environment.

Since toxic elements may be leached from the disturbed overburden, it is strongly recommended that trace element concentrations be monitored in ground waters surrounding the site, and in surface waters downstream from the site.

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d. Highly variable chemical values obtained at single well sites (Table 2) may present problems to hydrologic interpretations when they are based on single values.

2. Probably Impact

a. The EIS (p. III-13) does not make the point that pumping water from the pit into Little Thunder Creek will raise the salinity of the creek, and will probably make the water downstream from the mine unsuitable for livestock and wildlife use. This is a relatively minor and local problem when the ARCO mine is considered in isolation, but the cumulative effect of all the proposed operations in the region on surface water quality could be very significant.

Any ground water that is released into the surface drainage will cause severe deterioration of the surface water quality. The Roland Seam is a regional aquifer so that there will be discharge of ground water during the mining operation. The ground water, with respect to major ions, is of very poor quality (average approximately 2,000 ppm total dissolved solids; see Table 3a and 3b). For a frame of reference the recent controversy between Mexico and the United States over the quality of water delivered by the Colorado River concerned an increase from 850 to nearly 1500 ppm total dissolved solids. The Mexicans found the higher figure to be unsuitable for irrigation and the government of Mexico lodged a formal protest precipitating an international incident.

The surface water, on the other hand, with the exception of one very minor tributary, is of relatively good quality (average approximately 700 ppm dissolved solids; see Tables 3c and 3d). For a frame of reference, the drinking water standards of the World

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Health Organization and the U.S. Public Health Service are shown in Table 4.

This degradation of surface water will be especially high during the summer months when surface drainage is low and the rate of evaporation is high. Evaporation in the Powder River Basin is inevitable and will make waters such as those characterizing the Wasatch Formation (Table 3a) and the Roland Seam (Table 3b) unsuitable for irrigation.

This question should be discussed in more detail in the impact statement. Also, since ARCO has many analyses of ground waters from the coal and overburden (the waters which will probably be pumped from the pit), we think the impact statement should include a tabulation of these analyses.

b. On page III-130, it is stated that irrigation will be used, if necessary, to re-establish vegetation, but the proposed source of irrigation water is not mentioned. In view of its salinity and sodium content, the suitability of the local ground water for irrigation is questionable. Whether or not the water is completely unusable is outside our field of competence. The EIS should be more specific as to the feasibility of irrigation, particularly since irrigation is likely to be needed only in the event of a general drought, at which time other demands for water will be high, and supplies will be at a minimum.

c. The EIS should discuss the problem of acid rain resulting from SO_2 release from generating plants and gasification plants. A recent article in Science (v. 184, p. 1176-1179, June 14, 1974) documents that acid rain is a serious environmental problem

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in the northeast United States. It is very possible that it may become a problem downwind from generating plants in Wyoming.

d. Molybdenum acts similarly to selenium in affecting ungulate milk production and may be accumulative downwind, so the cumulative effects of both these elements could be extremely adverse. Antelope may be more susceptible than domestic cattle. Mercury is a well-known poison that becomes airborne through coal combustion. Little is known of its fate after it leaves a stack. Coal partings are noteworthy places for concentrations of mercury and uranium.

3. Mitigating Measures

The only way to avoid degradation of surface water quality would be to contain all waters pumped from the pit and not release them into the environment. Barring that alternative, we strongly suggest that monitoring stations be set up at the mine and at several points downstream from the mine in order to monitor these effects.

TABLE 1. ANALYSES OF COAL AND OVERBURDEN ROCKS: RANGES AND AVERAGES FOR FIVE NON-VOLATILE ELEMENTS (IN PPM)

Core #	Depth Range	Type	Number Samples	Cu			Pb			Cd			Be			Mo	
				Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min.	Max.	Ave.	Min	Max
BT 87	59-127	Coal*	12	2	130	28	5	50	**	<0.2	4	<0.2	0.1	3	0.4	<1	13
BT 104	81-129	Coal Over-	22	3	70	11	5	10	**	<0.2	1	<0.2	0.1	1.7	0.4	<1	15
BT 109	11-101	burden	16	3	100	35	5	50	**	<0.5	4	1.6	1.5	8	3.7	<5	30
BT 109	102-175	Coal Under-	8	5	30	9	5	8	**	<0.2	<0.2	<0.2	0.1	1	0.3	<1	3
BT 109	175-207	Burden Over-	8	4	130	50	<5	50	**	<2	5	2	1	10	6	<5	15
BT 111	11- 74	Burden	13	10	80	25	10	50	**	<2	7+	1	1	5	3	<5	15
BT 111	74-144	Coal Under-	7	7	11	9	4	7	**	<0.2	<0.2	<0.2	0.1	0.6	0.3	<1	2
BT 111	144-153	Burden	2	20	25	22	5	40	**	<0.2	2.5	1.3	4	7	5	3	6
Coal/shale Reported average abundances				15/45		25/20		25/20		-/0.3		3/3		5/2.5			

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*One sample had 50% ash and much higher metal content

**Lead results are uncertain at this time; polarographic analysis has established ranges.

tone sample in this series read 50 ppm cd, confirmed polarographically.

- Notes
1. We are in process of analyzing for volatile elements, and are not prepared to release figures at this time.
 2. Leading experiments are under way, but are not yet completed.

From: ~~the~~ *Forthcoming Research Report*, Department of Geology,
Univ. of Wyoming by Dr. Ronald Sutherland.

TABLE 2. Comparisons of well analyses

Sample #/Date/ T-U	Ca	Mg	Na	SO ₄	HCO ₃	Cl
R-8/7-3-73/Them	305	123	410	1670	475	25
R-8/7-11-73/Them	72	34	260	210	780	25
R-8/9-19-73/Them	43	27	235	11	800	59
R-8/12-3-73/Us	26	27	249	180	576	13
R-156/10-9-73/Them	152	80	68	660	162	16
R-156/12-3-73/US	247	103	100	808	451	1.7
R-153/7-27-73/Them	305	114	126	1050	450	30
R-153/12-3-73/Us	203	76	85	883	---	15
Reserv/4-16-73/Them	57	21	35	160	135	20
Reserv/12-3-73/Us	48	22	58	215	120	1.4
W-4/10-3-73/Them	385	346	764	3200	647	113
W-4/12-3-73/Us	484	479	700	3456	632	183
W-2/3-31-73/Them	710	230	340	3100	200	47
W-2/2-26-74/Us	458	222	155	1900	533	14
W-10/5-8-73/Them	100	66	420	990	433	34
W-10/2-26-74/Us	128	56	395	830	678	7
R-151/7-27-73/Them	220	80	180	650	520	40
R-151/2-26-74/Us	203	83	90	565	560	8
R-14/5-24-73/Them	119	20	375	380	872	60
R-14/2-26-74/Us	97	33	300	355	800	9
CBS/3-22-73/Them	137	50	60	450	205	30
CE/2-26-74/Us	120	45	54	400	235	3

From: Forthcoming Research Report, Department of geology,

TABLE 3. Extreme and Average Major Element Compositions of Selected Well Waters and Surface Waters (PPM)

A. Sample Type: Wasatch Wells
Number Samples: 15 (6 'us' + 9 'them')

Element:	Min	Max	Av
Ca	8	710	210
Mg	20	480	125
Na	200	765	375
SO ₄	35	3500	1280
Cl	7	180	50
HCO ₃	150	800	500
SiO ₂	5	20	10
TDS	675	6000	2200

B. Sample Type: Roland Wells
Number Samples: 22 (9 'us' + 13 'them')

Element	Min	Max	Av
Ca	25	380	170
Mg	18	210	75
Na	60	500	235
SO ₄	50	1670	650
Cl	1	60	25
HCO ₃	165	1240	580
SiO ₂	6	30	13
TDS	500	2800	1630

C. Sample Type: Surface
Number Samples: 6 (2 'us' + 4 'them')

Element	Min	Max	Av.
Ca	39	310	120
Mg	6	110	42
Na	35	230	80
SO ₄	125	1370	450
Cl	1	60	20
HCO ₃	60	275	170
SiO ₂	<1	15	4
TDS	230	2370	880

D. Surface: Thunder Crk only + Reserv.
5 samples (2 'us' + 3 'them')

Element	Min	Max	Av.
Ca	39	137	80
Mg	6	50	29
Na	35	60	48
SO ₄	125	450	270
Cl	1	30	13
HCO ₃	60	235	150
SiO ₂	<1	15	5
TDS	230	920	600

From: Forthcoming Research Report, Department of geology,
University of Wyoming, by Dr. Ronald Surdam

WATER QUALITY CRITERIA

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TABLE 4^a
COMPARISON OF CHEMICAL CONSTITUENTS IN THE DRINKING WATER STANDARDS OF THE
WORLD HEALTH ORGANIZATION AND THE U.S. PUBLIC HEALTH SERVICE

Chemical Constituent	WHO International (1958)			Concentrations in Milligrams Per Liter			
	Permissible Limit	Excessive Limit	Maximum Allowable	WHO European (1961)		U.S.P.H.S. (1962)	
				Recommended Limit	Tolerance Limit	Recommended Limit	Maximum Allowable
Allyl benzene sulfonate	--	--	--	--	--	0.5	--
Ammonia (NH ₃)	--	--	--	0.5	--	--	--
Arsenic	--	--	0.2	--	0.2	0.01	0.05
Barium	--	--	--	--	--	--	1.0
Cadmium	--	--	--	--	0.05	--	0.01
Calcium	75	200	--	--	--	--	--
Carbon chloroform extract	--	600	--	--	--	0.2	--
Chloride	200	--	--	350	--	250	--
Chromium (hexavalent)	--	--	0.05	--	0.05	--	0.05
Copper	1.0	1.5	--	3.0*	--	1.0	--
Cyanide	--	--	0.01	--	0.01	0.01	0.2
Fluoride	--	--	--	1.5	--	0.8-1.7#	1.0-3.4#
Iron	0.3	1.0	--	0.1	--	0.3	--
Lead	--	--	0.1	--	0.1	--	0.05
Magnesium	50	150	--	125**	--	--	--
Magnesium + Sodium sulfate	500	1000	--	--	--	--	--
Manganese	0.1	0.5	--	0.1	--	0.05	--
Nitrate (as NO ₃)	--	--	--	50	--	45	--
Oxygen, dissolved (minimum)	--	--	--	5.0	--	--	--
Phenolic compounds (as phenols)	0.001	0.002	--	0.001	--	--	--
Selenium	--	--	0.05	--	0.05	0.001	--
Silver	--	--	--	--	--	--	0.01
Sulfate	200	400	--	250	--	--	0.05
Total solids	500	1500	--	--	--	250	--
Zinc	5.0	15	--	5.0	--	5.0	--

* After 16 hours contact with new pipes; but water entering a distribution system should have less than 0.05 mg/l of copper.

** If there are 250 mg/l of sulfate present, magnesium should not exceed 30 mg/l.

Recommended limits and maximum allowable concentrations vary inversely with mean annual temperature. See table 5-1.

D. Water Resources

The water section of the EIS presents a modest amount of figures and descriptions, but like other resource sections, its presentation is inadequate, unclear, conflicting and, in places, not based in fact. The groundwater description is probably overly optimistic. Surface water resources are not fully discussed in terms of availability, changes in use and the impacts of diversion -- both in-basin and trans-basin diversions. The impact for northeast Wyoming and for other areas of the State which may lose water to Powder River Basin coal development cannot be assessed.

The statement fluctuates between a show of water scarcity and apparent abundance. Most of the figures used in describing the water resource have come from the Wyoming Water Plan and little new or interpretive information has been added in the EIS. This is unfortunate because the tables and charts showing irrigated acres, filings for new reservoirs, compact percentages and so on, are not related in the statement to the industrial water uses for the region or for specific development. To be useful, the EIS should show graphically where excess surface and underground waters exist and where water will be needed for coal development. How water will be transported, and who and what is impacted in the process should be specified. Does this statement advocate transfer of water rights from agriculture to industry? Enough time should be allocated by the BLM to make the necessary additions in the statement for some understandable comparison between present storage and future storage as they relate to yearly fluctuations, stream flows, and evaporation.

Some decision will have to be made on which rivers are to be

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included in the EIS for description and impact analysis. In the statement there is constant shifting from one section to the next, first including one river in a table and then excluding it in the next. The result is total confusion.

On page I-54, the EIS makes a major error. There is not an infinitely large supply of ground water based on 150,000 acre feet per year. In fact, there is no basis for this figure. The latest Wyoming Water Plan shows considerably less and without further information, it is not possible to say how much can be withdrawn under the "safe yield" concept.

In the previous paragraph on I-54, the reference to increased irrigation in drought years should be clarified. The discussion on I-53,54 is misleading. Oil field and deeper aquifers should be separated from shallow aquifer characteristics. The EIS gives the impression that there is a surplus of shallow ground water (I-257). This just is not correct.

Page I-195, paragraph two, is misleading. The deeper formations hardly outcrop nearby. They outcrop more than fifty miles away.

Table 16, page I-200-201, shows well records for selected wells. The maximum yields from the geologic sources of the wells are listed below; they are, however, probably unrealistically high.

White River	200 gpm
Wasatch	500 gpm
Lance	1000 gpm
Fort Union	500 gpm
Fox Hills	200 gpm
Inyan Kara Grp	100 gpm
Hulett	100 gpm
Minnelusa	1000 gpm
Madison	1000 gpm

The map on page I-228 shows good water quality in the area ETSI wells.

On page I-232 it is stated the drainage pattern is dendritic. However, the drainage pattern is distinctly parallel and control is not random.

It is unclear on page I-255, last sentence, if the largest use is by volume, by number, or beneficial use. Is the implication correct that water is not good for much of anything?

On page I-257, the last sentence in the first paragraph states, "The water yielding capacity of the Madison in Campbell County and northern Converse County, however, is not known." This point is important, yet it is not given the proper emphasis. In fact, with the number of times figures are listed for the available amount of ground water the true situation as given in the sentence above loses all meaning.

Absent from the EIS is a discussion of water quality and quantity changes which will occur with the mining of aquifers. Aside from impacting a few nearby wells, the statement does not discuss alkali lakes which will form in mine cuts and the leaching of trace elements.

There is also no discussion of the effect of dumping saline Green River water into the Basin as shown in the Wyoming Water Plan.

The statement does not recognize or make use of recent research on the Decker Mine in Montana which documents seepage

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of surface and near surface waters into mine pits and the associated water degradation. This problem needs recognition in the Powder River Basin.

Particularly disturbing is the summary section on water impacts although the inadequate water data which precedes it could hardly lead to any other conclusion. Essentially, the summary says that the EIS will not assess the impact of water use and that the impact on water quality is unknown (I-502). Is this the basis for decision-making?

E. Biota: Vegetation, Wildlife and Fish

1. Introduction

To make a reasonable assessment of the impact of coal development on natural ecosystems, we maintain that as minimum criteria the following baseline information on the biota is essential.

a. Quantitative description, including measurements of productivity, of vegetation in habitats representative of the area to be disturbed.

b. Accurate population estimates and resource requirements (E.G., food sources, migration routes, environmental tolerances) for economically important species such as game birds, game mammals, game fish, and major predators and furbearers. Cost-benefit analysis for the development cannot be made without the information from (a) and (b).

c. Species richness, relative abundance and general resource requirements of vertebrate species not directly of economic importance but functioning as integral components of the ecosystem: e.g., non-game mammals, non-game birds, non-game fish, reptiles, and amphibians.

d. Quantitative survey of above-ground terrestrial and aquatic invertebrates for estimations of species richness, relative abundance, habitat use and general trophic relationships.

e. Quantitative description of representative soil communities including taxa present, their relative abundance, trophic relationships and decomposition rates.

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f. Population estimates and distributions of rare and endangered species.

g. Because of cyclic nature of plant productivity and animal populations, the above data from (a) through (f) should be collected over a period of several years.

h. In addition to the above baseline information describing the ecosystems, variables to be introduced by the development must be specified: e.g., changes in drainage patterns, potential toxic elements in overburden, emissions, etc. Small scale experiments should be performed to assess the effect of major introduced variables on the major components of the ecosystems and on the relationships between components.

i. Research and data collection should be coordinated in such a way as to be used in the construction of a general ecosystem model. Such a model could be used to predict the effect of various types of disturbance on the ecosystem and its components.

As biologists we concur that the above information is necessary in order to comply with NEPA. (See the introduction to this review.) The following critique of the Biota section of the EIS is based upon the adequacy of its compliance with these criteria.

2. Vegetation

a. Adequacy of description

The origin of the fifty percent reduction figure, for vegetation, frequently cited, is not at all clear. There is no data to support the figure.

In the report, the fifty percent figure seems to be used in different ways. For example, on page I-59, there is the statement, "There will be a fifty percent loss in productivity for grazing purposes," and on page I-513, "The total vegetative cover will be greatly reduced, probably near fifty percent of that found on adjacent undisturbed range." And on page I-861, there is the statement, "Long-term productivity of this land will be lowered by fifty percent, or 2,600 animal unit months per year." None of these statements are using the word productivity correctly, from an ecological perspective.

On page I-143, no source is given for the productivity estimates, nor is mention made of how they were obtained (an important consideration). Both values given are from relatively uncommon soil conditions, which represent the extremes. What is the productivity on the average site to be stripmined? Cycling and biomass dynamics of the current vegetation are not considered, but such information is not easily obtained and probably nonexistent.

Further, there is no data on current productivity of each vegetation type and no data on species' relative abundance. Such data are important for evaluating rehabilitation success, and also in planning for successful rehabilitation. These data are not provided in volumes III or IV as well. Though rare and endangered species are considered under wildlife, no mention is made about rare and endangered plant species. Was this possibility considered? Will rare habitats be destroyed? There is no mention of this possibility.

The vegetation map is not well prepared, but there may be nothing better available. The vegetation was well mapped for each of the leases made thus far. The vegetation description for

the railroad impact (II-65) is very sketchy, certainly not an adequate description by itself. A short treatment such as this would be acceptable if the section on vegetation in Part I was complete (page I-268 to I-277), which it is not. The ARCO lease vegetation description is somewhat better, but there is still no data on productivity, or species' relative abundance, nor sources of information.

A few small points follow:

- On pages I-268 and I-269, the statement that buffalo has a "profound effect" on vegetation is unclear. Also, the discussion on zootic climax and the role of big sagebrush is rather antiquated, in view of current thoughts about ecosystem structure and function.

- Why was the word "latitude" used in the first paragraph on page I-269?

- The term "dry meadow grassland" is very inappropriate and confusing, especially considering the species composition which is typical of a mesic situation.

- There are a number of errors (at least ten) in the spelling of scientific names, and silver sagebrush is not Artemisia tridentata.

- Radiation data seemed inadequate. Is nothing better for the area available?

- There are no sources of mulch listed for reclamation of 1,000 to 12,000 acres of land per year (I-59).

The report is accurate in recognizing the importance of negative precipitation-evaporation ratio, climate, and topsoil to successful rehabilitation of the land, and in recognizing the

significance of special, natural, periodic phenomena, e.g. drought (pest outbreaks might have been included also, e.g. grasshoppers) but the goals of rehabilitation in the area are never stated in quantitative terms. Since there is no basis for suggesting that mined land can be returned to grazing after a five year time span (I-59) the EIS should assess the consequences of rehabilitation failures or supporting evidence given for the 70-80 percent successful rehabilitation figure (I-79, 80, 504-507). This has not been provided.

b. Analysis of Accumulated Regional Impacts

Impacts on the vegetation of the proposed developments are considered, but the statements are sometimes not backed up by references, and data are lacking in many cases. Thus, evaluation is difficult. As the Task Force acknowledges, more research is necessary. For example, in Table 10, page I 505, the comment is relevant to both the vegetation section and other sections also. The figures in this table are both appropriate and impressive, but a final decision on the importance of the impact cannot be made until the figures for each vegetation type are also expressed as a percentage of the total area occupied by each type in the Eastern Powder River Basin for which the EIS is prepared, and also as a percentage of the total area in the Basin. The same can be said for the data and discussion on page I-650, I-653, and I-688. The percentages are likely to be very small, e.g. on page I-662 where this was done essentially for loss of livestock forage. More of these calculations are needed and they can be done without much difficulty.

Along this same line of thought, if populations of wildlife

will be lowered, what will the percentage reduction be for the entire Eastern Powder River Basin? On page I-525, the statement is made, "...this habitat disturbance will most likely have a long term cumulative impact on fish and wildlife populations and could result in losses which cannot be presently quantified." How can one evaluate impact from such generalities?

The section of the environmental effects of stack emission is incomplete. Statements such as, "Industrialization and development of the study area will result in a decline in ambient air quality," and "Effect of emission on vegetation and animals is not well understood at this time...." (I-466,467) are indicative of research insufficiency and are not acceptable in an environmental impact statement. Is it possible to be more specific than the reference to "industrial fumes and dust?" (I-507).

There is an inadequate discussion of toxicity hazards with soil disruption. What toxic trace elements, in addition to boron, are present in the overburden spoils and what biotic impact is anticipated with exposure to these soils? Comments such as "Toxic chemicals which could be present in the deposited dust...", "Dust-covered vegetation...possibly toxic to livestock and wildlife," (I-111, 112) indicate a state of affairs which must be corrected. Ignorance of the nature of toxicants that will be released to air, water, and soil, the quantities of each and their respective susceptibilities to bioamplification in terrestrial ecosystems could have profound and irreversible effects on agriculture and animal and human health.

c. Mitigating Measures

Choice of seed is taken far too lightly in the discussion of

rehabilitation. There is no reason to restrict choice of seed to cool season species (I-633).

The statement is made that rehabilitation has not been difficult elsewhere in the area, but no references are cited so that the reader can judge (I-631). The emphasis seems to be on just getting something established, which may be realistic, but the ARCO revised reclamation plan (May 20, 1974) demonstrates more insights into what reclamation means ecologically.

Perhaps some impact could be minimized by greater cooperation between the companies involved, for example, by supporting a paleo-archeologist as suggested, or by financing needed research to find answers to many unanswered questions raised by the EIS. Power companies could cooperate more in the establishment of power line corridors (where these are desirable) and by using common structures where possible rather than building separate power lines side-by-side, as has been known to happen.

d. Probable Adverse Impacts

There are three points to make in this section

(1) There is insufficient analysis of the consequences of increased unavoidable stack emissions, e.g. approximate doubling of sulfur dioxide, nitrogen oxides, carbon dioxide, between 1980 and 1990. No mention is made of selenium, mercury, or other toxic trace element releases (I-647-655). The statement "Adverse impact of stack emissions especially sulfur dioxide on vegetation is unknown," is not acceptable (I-655).

(2) There is no basis for the statement that vegetation destruction on 14,000 strip-mined acres will be temporary. Consideration of erosion and how it can be controlled is of fundamental importance

here and in all other sections mentioning revegetation. (I-655)

(3) The five percent rehabilitation failure is inconsistent with predicted 20-30 percent unsuccessful rehabilitation noted on page I-79.

e. Summary

Reviewing a regional impact statement is better than reviewing a mine by mine impact, but it is nevertheless frustrating because a national perspective on impact is so badly needed. Much of Wyoming's coal will be shipped elsewhere for burning at a high rate of unit trains per day. The ecological impact of burning all this coal, wherever it may be, may be the major impact and its effect may be felt world-wide. The U.S. government, by permitting the utilization of the coal in the Powder River Basin, is encouraging further consumption of all finite resources by the nation and the world. This may be permissible, but a conscientious evaluation of the Powder River Basin EIS seems myopic without pointing out that little is said about impact outside the Basin. The frustration of evaluating the impact of each mine individually led, in part, to this regional EIS. Perhaps the frustration of evaluating impact for a small region will lead to a national or continental approach, if not a world-wide approach.

The EIS should have referenced sources of information in the text, but even if this had been done, there would still be a general lack of information. Considering the information base and the unwise haste in which the EIS was prepared, the Task Force did quite a good job. The EIS, however, makes many statements which tell us essentially nothing useful for decision-making which we did not know before, e.g., many "could have injurious effects"

type statements, and others such as "serious impacts on health" without explanation, "... certain qualitative impacts can be predicted," and "overall water quality may decrease," again, without any explanation.

If the Task Force Conclusions on adverse effects are true and submitted with the proper perspective, then one could conclude that the mining should be postponed until suitable solutions are found.

The direct impacts of mining on vegetation are obvious, but secondary impacts of other activities may include vegetation. These are not well done. More information is needed to properly evaluate impacts, with special attention paid to the secondary, indirect impacts.

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3. Wildlife and Fish

a. Existing Environment

(1) Wildlife

Big Game. Information on big game is more complete than any other section under wildlife but two important items of information are lackign: 1) for deer and antelope population figures are presented only for the winter 73-74 (Table 28, 1323). Since ungulate populations can fluctuate significantly in density from year to year, population estimates should be presented for several years prior to development, and 2) no information is presented on elk migration routes.

Other Mammals. No population estimates were available for any predators or furbearers. Data based on limited sampling were presented for rabbit, hare and rodent populations densities; but it appears these estimates were based on short term sampling in only three small areas of the region.

Birds. Of the six game bird species in the region, population estimates were available only for one, the sage grouse.

No population estimates were presented for waterfowl, shore-birds or raptors. Estimates of song bird densities were provided from only one short term study in only one location. This limited sampling cannot be considered to represent accurately the song bird community of the region.

Endangered Species. No population or distributional data were presented for any species listed as rare or endangered.

Invertebrates. Quantitative and even qualitative data, such as species lists, are completely lacking for all invertebrates. The extreme generality of the material presented (I-344) reduces it to fatuous trivia.

(2) Aquatic/Fish

There are no references to the "various technical reports" (I-339_ used in part as the basis for the descriptions of drainages in general and of the "selected individual habitats," or as the basis of "List of Known and Probable Fish Species Found in the Study Area," (Table 32, Appendix C). Also, there is no methodological information. Hence one is unable to assess the little data which are included in the section. However, judging from the text the information available must have been minimal and analyzed in haste (e.g., smallmouth bass is listed as occurring in Keyhole Reservoir, but is not included in the "List of Known and Probable Fish Species Found in the Study Area" (Table 32, Appendix C); 14 of the 37 species of fish listed in Table 32, Appendix C, are not mentioned anywhere in the discussion; a nonexistent fish (the flathead minnow) is mentioned on page I-342; the flathead catfish, Pylodictus olivaris is not officially known to occur in Wyoming, and if it does occur it is rare; northern pike is not listed in Table 32, Appendix C; the goldeye is mentioned on page I-346 as being on the U.S. Department of the Interior's "rare and endangered" list for Wyoming, but it is not indicated as "rare" in Table 32, Appendix C.)

In addition to the above, the description of the aquatic environment (fish and other) is inadequate since:

- There is no complete list of fish species occurring in any location.

- There are no data on aquatic invertebrates which occur in the basin, with the exception of two phyla and 4 orders mentioned on page I-344.

- There are no data on aquatic plants and algae which occur in the basin, either in the section on "Vegetation" (I-268) or "Fish" (I-339).

- There is no information of the locations of smaller ponds, streams, or reservoirs which may contain game fish, or which are mentioned as having been stocked.

- There is no physical description (e.g., surface area, volume) of water bodies so one doesn't even know approximately how much surface water there is in the area (surface areas are given for several of the larger reservoirs).

- Rare and endangered species: if the flathead catfish occurs in Wyoming it is rare. If the region includes the Niobrara River drainage, two other important rare and endangered species are the pearl dace and the finscale dace. It seems likely that the sturgeon chub will be listed on the rare and endangered species list for the U.S. within ten years. As discussed under B-9 below, construction of reservoirs could eliminate the sturgeon chub.

(3) Summary

We have four major criticisms:

- a) For the little data that were presented, important specifics were omitted such as time of sampling, specific sampling sites and sampling methodology. These omissions make it impossible to evaluate the figures presented in the text.

b) There are existing studies which could have profitably been included in the EIS. For example, the grassland IBP has accumulated large amounts of data on short grass ecosystems. In components where there are simply no data available, such as invertebrates, some of the IBP data could have been used.

Data on many of the areas missing from the EIS has been and is being gathered by a University of Wyoming research team since the summer of 1973. This material will be available in the latter half of 1979. These facts were known to the compilers of the EIS at the time they were writing the material.

c) A large percentage of statements in the EIS list no sources.

d) Finally, the paucity of facts in the EIS accentuates the obvious -- there is simply no information available on the population dynamics of 99.99% of the animal species inhabiting the Powder River Basin, and, more importantly, there is no information on the interaction between any of the components.

b. Probable Cumulative Regional Impacts

(1) Wildlife

There is a long and reasonable discussion of what the impact on wildlife might be as a function of destroyed and altered habitat. But because of the lack of specific information, most of the projections are merely conjecture.

Threatened Species. With the information available it is impossible to assess the impact on the endangered species in the region, as was emphasized in the EIS:

Inventories as to the exact occurrence and dependency of these species on the area to be developed and/or disturbed have not been accomplished. Therefore, precise impacts cannot

be analyzed at this time.... Without adequate knowledge of ranges and habitat requirements, a reduction in range may have serious long-term consequences. (I-529)

Big Game. Reasonable estimates are made on the reduction of the size of big game herds because of the loss of habitat. Some statements, however, are guesswork. For example, "...50 percent of the total area disturbed by 1990 will be lost as deer habitat." There is simply no data available to support such a statement. Until specific information is obtained on the success of revegetation of a variety of plant communities, no accurate estimation can be made of the short-term or long-term reduction in size of the big game herds.

Another impact which was mentioned but not pursued is that of increased hunting, fishing and camping. If one assumes that hunters in the region will increase in proportion of the total population increase, there could be as many as 30,000 potential deer hunters in the region in 1990 (extrapolating from the figures given in Table 28, I-323). The deer population is estimated to be only 16,800. Obviously adjacent areas will be forced to absorb some of the hunting and fishing impact. Ultimately this means fewer licenses available per capita, smaller creel limits, increased management and supervision of game animals, stricter enforcement of game laws and more maintenance for camping and recreation areas. Some estimation should be made of what additional personnel will be needed by the federal, state and local agencies.

Other mammals. For most of the nongame mammals no assessment of impact can be made because the needed information is not included in the EIS.

Birds. A guess was made on the impact on water fowl (I-533). Again, no impact analysis is possible for most species because

of insufficient information.

Invertebrates. "Existing populations are diverse, numerous and important for their positions in food chains." (I-535). This statement is true for any ecosystem -- again, where are the specifics?

Everything on invertebrates in the EIS is so general as to be worthless in assessing any impact. Quantitative data should be presented on above ground invertebrates, aquatic invertebrates and soil invertebrates. In mined areas soil organisms will be severely affected, and this could result in a long-term decrease in the rate of decomposition and ultimately nutrient cycling. Decreases in plant species diversity will automatically result in a decrease in the insect species diversity. This simplified system could be more susceptible to environmental perturbations in the form of climatic changes, herbivores, parasites and disease than undisturbed praries.

(2) Aquatic/Fish

Because of the lack of data listed under "Description of the Existing Environment," and because of reasons listed below, it is not possible to evaluate regional impacts.

- There is no description of the amount of standing water (e.g. surface acres, number of ponds, miles of stream/river) which will be destroyed, or otherwise directly or indirectly affected by any of the projects.

- The above is true for off-site developments, despite the suggestion that the effect of off-site developments "...cannot be overemphasized." (I-528)

- There is no discussion of any aquatic plant or animal life other than fish.

- There is no discussion of chemical hazards (e.g. toxic

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elements) under "Hazards introduced into the environment." (I-526)

- There are no data on, and only the most vague and general statements about, the effects of the following:

1) alteration of stream flow or pond/lake volume via release or use of water;

2) the amount and composition of petroleum products, detergents, solvents, sewage or other compounds which may be released into waters;

3) the changes expected in dissolved ions' not even estimates, only statements that dissolved solids will probably increase below areas of development;

4) the amount and type of potentially toxic elements or compounds reaching surface waters;

5) the amount of suspended particulate matter reaching surface waters.

- Some (not all) of the variables above are acknowledged as affecting the capacity of surface waters to support fish. However, no data are presented on "tolerance," "acceptable levels," or any other measure of the ability of any aquatic animal or plant to withstand the effects of any of the variables. Some such information is available.

- It is suggested that new ponds and reservoirs may create new fisheries "...if water quality is adequate" (e.g., p. I-532). However, from the discussion of Water Resources (p. I-156, I-249, I-479), the quality of available waters and high evaporative rates make this doubtful in many or most cases. No indication is given concerning where most of the "ponds" would be located.

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- There is no discussion of the possible effects of stack emissions on aquatic environments. In some cases they have profoundly affected the chemistry and biology of lakes, eliminating certain fisheries.

- Apparently not discussed are two very likely events:

1) There will almost have to be a large storage reservoir, for water needs, constructed on the Powder River somewhere about halfway down at about Kaycee. This will clear up the river for some distance downstream. This will also occur below any other reservoirs constructed on the Little Powder River, Little Missouri River, Belle Fourche River or Cheyenne River.

2) Most of the fish species (i.e., plains minnow, sturgeon chub, flathead chub, silvery minnow, goldeye, shovelnose sturgeon, river carp-sucker) of the above drainages are quite specialized species adapted to the very turbid waters of the upper Missouri River drainage. To clear up these streams will eliminate the above mentioned species, and the habitat will be taken over by the white sucker, creek chub, green sunfish, carp and other nongame species. This has occurred in the North Platte River after reservoirs were constructed. Hence, there is a real possibility of eliminating the rare sturgeon chub in addition to drastically altering the species composition of fish in the area.

In summary, with this assessment of regional impacts on fish and wildlife, the EIS made a noble attempt with the material available but difficulties emerged from two directions: 1) Inadequate baseline data, and 2) inadequate information on the number, location, and size of the development projects. As stated in the EIS,

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"The extent and types of faunal effects cannot be determined at this time. The prediction would depend upon presently unavailable information, including location and size of projects." (I-528) There cannot be even a feeble attempt at a regional impact analysis unless all proposed developments in the region are specified by size and location.

c. Mitigating Measures

The EIS makes no mention of mitigating measures for wildlife and fish. There obviously are some, for instance:

- 1) stream diversions;
- 2) careful planning of road sites and fencing;
- 3) supplementary winter feeding for game animals;
- 4) mining plans which maximize recovery of top soil;
- 5) establishment of grassland wilderness areas;
- 6) maintain stream and reservoir water quality;
- 7) not disturbing critical water sheds or habitats.

d. Probable Effects Which Cannot Be Avoided

1) Wildlife

There are no estimates of:

- number of threatened species which will be lost;
- loss of upland game birds other than sage grouse;
- loss of predators, furbearers, small mammals, song birds, and shore birds;
- Loss of important above ground invertebrates, such as pollinators;
- Loss of important soil organisms, such as saprophytic nematodes and arthropods, and mycoorhyzal fungi.

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2) Fish and other aquatic animals

There are no estimates of:

- the amount of aquatic habitat which will be destroyed or affected;
- the aquatic species (plant or animal) which will be killed or affected;
- the number of each species which will be killed or affected;
- the way in which water quality will be altered.

e. Short-Term Versus Long-term, and Irreversible and Irretrievable

1) Wildlife

Every short term effect could become a long term effect, depending on the success of reclamation. Since there is no data presented in the EIS (or available elsewhere) on the long-term success of reclamation it is impossible to predict what the long-term effects of development will be on wildlife in the Powder River Basin.

2) Fish/Aquatic

There is no discussion of aquatic habitats/organisms. Further, the EIS does not evaluate the impact of getting needed water to the Powder River Basin. For example, it is mentioned that imported water would most likely come from the Green River, and that "...construction of a reservoir on the Green River would cause significant habitat (and productivity) loss in that part of the state." There was no discussion of, or data from that part of the state anywhere in the regional analysis. Also, additional water may not necessarily

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come from the Green River. The Bighorn River has "extra" water, and it could be brought across from Boysen to the headwaters (dry) of the Powder River west of Casper and impounded in a reservoir in the Kaycee area.

In reference to the specific projects in Volumes III and IV, there is less specific information than under the regional section. There should be very specific information on what, where and how many at each site. On-site information is almost completely lacking.

4. Summary

a. Description of the Existing Environment

The description of the existing environment is inadequate since there is little or no information on the following:

- 1) quantitative data on vegetation in habitats representative of the areas to be disturbed;

- 2) quantitative measurements of vegetation's productivity in the areas to be disturbed;

- 3) accurate population estimates for economically important species as game birds, game mammals, game fish, and major predators and furbearers;

- 4) Resource requirements (e.g., food sources, migration routes, environmental tolerances) for economically important species;

- 5) Information of the type outlined in 3 and 4 above for vertebrate species not of direct economic importance, but which function as integral components of the ecosystem (e.g., non-game mammals, non-game birds, non-game fish, reptiles and amphibians);

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6) quantitative survey of above ground terrestrial and aquatic invertebrates from which to estimate species present, their relative abundance, their trophic relationships, and decomposition rates;

7) Population estimates and distributions of rare and endangered species.

b. Data Analysis and Cumulative and Irreversible Impacts

Since the description of the existing biota is inadequate, it is impossible to make a reasonable assessment of the impact of development. However, even if data as outlines in (1) above were available, information of the following nature is also required before a reasonable assessment of development's impact can be made.

1) A complete description of all developments to be undertaken, and a fairly accurate description of off-site developments. Obviously, without this information one doesn't even know what will occur and hence cannot assess its impact.

2) Because of the variability in plant productivity and in the size of animal populations, information of the type outlined in (1) above is needed from a period of several years.

3) Data from published literature on the tolerance of organisms to perturbations which will occur as a result of both on and off-site development (e.g., changes in water chemistry, soil structure and composition; the presence of toxic elements or compounds and stack emissions; changes in recreational use of the area). Some such information is readily available in the published literature. No attempt was made to utilize this information in analyzing probably impact of development.

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4) Data from small scale experimentation to evaluate the tolerance of organisms to perturbations which will be introduced by development. A review of published literature would likely reveal critical areas where needed information on the ability of organisms to withstand development's perturbations is not available.

c. Additional Comments

Missing from the EIS is a detailed proposal for a long-term monitoring program for the mined and reclaimed areas. Basic baseline information will hopefully soon be available for specific areas being developed in the region, although it is not included in the EIS. Continuing studies of the biota need to be conducted; for instance, to determine the extent and time it takes for the biota to become reestablished after disturbance. Such information would be invaluable in the future as a basis for environmental impact appraisals of other similar sites, and to evaluate the accuracy of predictions about the impact of development.

Data collection and experimentation is currently underway at a variety of sites in the region. Hopefully this will continue in the future. There is currently no coordination between the various corporations, consulting firms, universities, and state and federal agencies which are conducting this research or which have pertinent data. A mechanism for such coordination seems particularly important for utilization of all available information, and especially so for the synthesis and analysis necessary for a reasonable assessment of development's impacts.

F. Aesthetics and Recreation Resources

In general, the discussions of aesthetics and recreation resources are honest evaluations of the potential impacts that can be anticipated from large-scale industrial activity. With the major exception of the discussion concerning primitive recreation resources and the lack of discussion on a statewide level, as well as proper source material identification, the sections are reasonably accurate assessments of future impact.

1. Description of Existing Environment

a. Aesthetics. The concept and use of photo-interpretation of the aesthetics of the Powder River Basin is well done. There are good descriptions of major features of interest in the region (page I-312). However, the report should mention the Thunder Basin National Grasslands as an important aesthetic feature.

The picture on page I-318 is inaccurate. The rock formation pictured is Camel Rock located on the Wyoming-Colorado border south of Laramie.

b. Recreation Resources. This section has a few inaccuracies which should be clarified or corrected. The map on page I-350 shows two state recreation regions but does not delineate their boundaries. On page I-352, the report states, "Large open parks in the timber, the most outstanding characteristic of the Big Horn and Black Hills, provide the sightseer more chance of viewing deer, elk, and occasional moose." Such a subjective value judgement is not justified. Other areas to be corrected follow in the discussion below.

--Water Base Recreation. The Tongue River should also be included (I-359) as being under consideration as a possible addition

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to the National Wild and Scenic Rivers System.

--Winter Recreation. The Laramie Mountains should be added to the Big Horns and Black Hills as an area which offers opportunities for cross-country skiing (I-360).

--Primitive Lands. On page I-362, the Cloud Peak Primitive Area is listed incorrectly as containing 94,000 acres. The Primitive Area in fact includes 137,000 acres. It would be useful to further qualify the present status of this area. In November 1973, in compliance with the Wilderness Act of 1964, the U.S. Forest Service proposed 150,490 acres to be reclassified as the Cloud Peak Wilderness Area. Considerable support for the "citizen-conservationist" proposal of 282,000 acres was voiced at the same time. Congress will ultimately determine the final acreage of the Cloud Peak wilderness area.

The remainder of this section is incomplete. Only one area is mentioned as having potential as a Primitive area--the North Fork Powder River including an area of 16,211 acres. Indeed, there are many more potential Primitive and Wilderness areas in this region. These are listed by managing agency below.

1) Bureau of Land Management

a) Middle Fork Powder River. There has been support to make this a Primitive area (10,950 acres); however, the BLM has proposed to manage this area as a "backcountry recreation area" in order to retain the natural condition of the area without formal designation.

b) Fortification Creek. This area has been identified by the BLM as a potential Primitive area of some 100,000 acres. The

ownership pattern poses problems: 50% federal, 40% private, and 10% state. The BLM is considering a protective withdrawal on these lands. A BLM report from the Casper District Office pointed out some of the interesting characteristics of this area: "This ecosystem is probably the only remaining area that closely resembles the ecology of the Powder River Basin prior to the influence of the white man....the area has value for comparability to assess ecological changes within the Powder River Basin, and as a reference point for anticipated mineral extraction activities."

2) U.S. Forest Service

a) Laramie Peak. An area of 10,420 acres was chosen for study as a Wilderness Candidate Area during the Roadless Area Review conducted by the U.S. Forest Service. Citizen groups have recommended an area of 26,800 acres. Regardless of size, this area in Converse County is an outstanding wildland resource.

b) Roadless Areas. There are numerous Roadless areas in both the Big Horn and Medicine Bow National Forests that deserve mentioning. These areas have provided and will continue to provide--if properly managed--quality primitive recreation opportunities for the population of the region, state, and nation.

--Medicine Bow National Forest, Laramie Peak Division:
Deer Creek, LaBonte Canyon, Buffalo Peak, and Eagle Peak.

--Big Horn National Forest: Cookstove Basin, Devil's Canyon^P-orcupine, Pete's Hole-Sunlight, Cloud Peak Continuous, Hazelton, Doyle Creek-Taylor Creek, Grommand Creek, Rock Creek, Piney Creek, Little Goose, Twin Lake-Coney Lake, Walker Prairie, Tongue River, and Little Big Horn.

c) National Grasslands. At this writing, the Medicine Bow Forest staff is inventorying small parcels of land that could be protected as "natural areas."

2. Probably Cumulative Regional Impacts

a. Aesthetics. Regardless of the individual's perception of aesthetics, it is evident that the character of the land will definitely be altered. This section adequately reflects the changes in scenic quality.

There is "one quote (I-516) which sets the tone for the impact on aesthetics: "Because of the many new vertical intrusions on the skyline, Devil's Tower will no longer be one of the Basin's unique distant sights..." This reflects the potential for degrading the unique scenic quality of our first National Monument and the surrounding countryside.

b. Recreation. This section, for the most part, is well done and portrays accurately the fact that a large influx of people will serve to diminish the quality of the recreation resource. The recreation land base is particularly limited in the region, and any reduction in availability will increase pressures significantly on remaining areas.

However, some references are unclear and recreational use figures are misleading. For example, what are the sources for the Projection Tables 12 and 13 (I-538, I-540)? What are the criteria for defining activities? The activity categories in Table 31 are too general. Furthermore, the percentage increases in recreational uses seem rather low. Particularly, "backcountry" recreation demands are in fact far higher than the other demands and should be analyzed as such. The ORRRC Report #3 substantiates considerable

increases in this type of recreational use, projecting a "tenfold increase from 1959 (level) in wilderness recreation in the United States by the year 2000" (page 124), and growth in total wilderness use in Wyoming by the year 2000 which would be "17 times the 1957 level"--the highest growth figure for any region in the United States, and far higher than the national average (ORRRC Report #3, Wilderness and Recreation - A Report on Resources, Values, and Problems, page 237).

While the statement recognizes that quality recreation is subjectively perceived, it does not relate this generalization to Wyoming and the impact on quality from increased population pressures. The influx of great numbers of people into this region will decrease the opportunities for open-space recreation as well as increase crowding in developed facilities. All recreational activities will be affected by at least one factor--more people on the finite recreation land base.

Many recreationists will eventually pursue their favorite pasttimes in far away locales. When one feels crowded (level of toleration differs with individuals), one moves on. The Southern Wyoming Range in Bridger National Forest is a good example of this situation. Recreational use in this area is increasing as people from Rock Springs and as far away as Salt Lake City are looking farther and farther from their backyards to find their preferred outdoor recreation pursuit.

Greater population will also result in increased demand for urban/community recreation facilities for people who cannot or will not seek recreation outside their locales. This is especially true in Wyoming where climate encourages indoor activities during part

of the year.

Finally, this section does not directly consider the state-wide impact on recreation resources. It alludes to it by stating: "Increased use of recreation resources outside the study area (Campbell-Converse counties) could result in the lowering of recreational quality in an ever-widening circle." (I-541).

The statement fails to assess the impact which large numbers of people will have on Wyoming's traditional open space values. The quality of hunting, fishing, and other resource-based recreation activities will be degraded. It will increase in-state visitation and overall use of already crowded National Parks where heavy traffic and overflowing campground and parking areas are commonplace. It will eventually place additional "people pressures" on all of Wyoming's existing and potential wilderness and primitive areas and wild and scenic rivers; these wildland resources provide contrast and escape from an industrialized state and should continue to gain value as high quality natural resources.

On page I-864, the statement notes that in the peripheral areas of communities extensive recreation will be superceded by intensive recreation. Open space recreation values (extensive) will be replaced by in-town community facilities (intensive). As towns grow and engulf the rural fringes, the character of the scenery will be altered, affecting both long-time residents and tourists. Once the neon signs arrive in Sundance, the beauty of the town and view of the countryside is diminished--and the magnet for tourists lost. The intangible costs of these losses are not given due consideration in the statement. Such long-term values

are an important factor in the renewable resource base of this region.

Conclusion

Outdoor recreation is essentially a personal phenomenon. Man seeks a relationship with nature--whether it is a challenging motorbike ride on a desert road, a family picnic along a sandy beach, or an evening sojourn with a sunset surrounded by glaciers and high granite peaks. It is also personal because it can be shared with close friends, family, a faithful dog, or one's inner self.

It is most satisfying when one senses a freedom of existence and open space. It is not satisfying when it is structured or infringed upon by others. When outdoor recreation becomes crowded it becomes impersonal and artificial.

Wyoming has excellent outdoor recreation opportunities. The characteristics of open space, free skies, clear water, and magnificent scenery accentuate a quality hunt, a remembered fishing trip, a challenge successfully met. Perhaps the greatest single asset of outdoor recreation in Wyoming is few numbers and ample space for all.

A large influx of people is a major threat to this quality outdoor recreation. Seeing others in your secret hunting spot, fishing elbow to elbow at the old fishing hole, having your picnic within sight, sound, and smell of your neighbors, and finding the freedom of wilderness very crowded are all results of people pressures.

The foundation of Wyoming's outdoor recreation--which is an important national resource--is very simply enjoying a large

open space resource. Open space for outdoor recreation is valued everywhere in the United States. Too many people on a finite land base, either in Wyoming or nationwide, will close the open spaces and degrade the quality outdoor recreation experience.

This impact statement should more thoroughly relate these particular values of outdoor recreation in Wyoming to the scope or potential impact in the Powder River Basin.

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G. Review of Agriculture

1. Description of the existing environment

Description of agriculture in the two-county area is inadequate since the information provided is not handled to show probable impact on the environment. Various errors and presumably unintentional misrepresentations appear throughout the sections on agriculture. A number of specific comments dealing with these errors and inadequacies follow.

a. It is stated (I-379) that "Demand for irrigation water exceeds the supply." If this is so, how can one justify providing power companies with water so that they compete with food production, in a water-short area? On page I-257 the EIS talks of large amounts of water being available in the tertiary formation, yet in the same breath it states "the nearest and most logical sources of additional supplies are from streams draining the Big Horn Mountains and Balck Hills, and from the Platte River System." Why is this water not currently available for irrigation if it is so readily accessible? Again, on page I-375: "The number of acres under irrigated crop production has been rising gradually over the years but is limited by water."

b. A portion of the last paragraph dealing with water shortage, on page I-379 is missing.

c. On page I-371 the statement is made that "sheep numbers have been on the decline in recent years. Numbers recorded were 303,700 head of sheep in 1974 for the two county area." Yet in Table 36 on the previous page, the total number of sheep in the two county area as of January, 1972 was only 243,400. This would seem

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to indicate that, in fact, sheep numbers are on the rise, thus requiring more forage and more water.

d. The statement is made on I-371 that "Sagebrush, by far the most common shrubby forage species, is utilized primarily by sheep." This statement is in error in that sagebrush is only utilized by sheep to any extent in the winter months. In fact, IBP Grassland Biome research has brought out the fact that wildlife are the primary utilizers of sagebrush. Additionally, according to IBP Reports, it is highly probable that in the Powder River Basin, snakeweed (Gutierrezia sarothrae) is as common as sagebrush since this is true in most rangeland habitats in southeast Wyoming and northeast Colorado. (IBP Reports.)

e. On page I-375 the statement is made that "Total dryland cropland has decreased over the years..." However, Table 40 (I-376) only provides averages for an 18-year period and does not provide support for this statement. It is further stated that "during the past two years, some of these lands have again been placed into crop production in response to recent changes of government farm programs and rises in grain prices." There is no support presented for this statement.

f. On page I-378 it is stated that "An average of 2,480 acres of cropland are annually irrigated in Campbell County compared to 65,073 acres devoted to dryland farming." Yet in Table 40 (I-376) the major irrigated crop average adds up to only just over 1000 acres and the major non-irrigated crop average adds up to over 75,117 acres.

Discrepancies between figures in tables and figures in the text occur frequently throughout the sections on Agriculture.

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Such errors are so frequent the text cannot be accepted as a reliable base of information.

2. Probable Cumulative Regional Impacts

Recent public announcements indicate there is no reason to think the ten electric generating plants proposed for the Powder River Basin five years ago in the North Central Power Study are not still being planned. If the EIS is going to be truly regional it should include all such proposals in tis regional analysis.

As in the previous section, a point-by-point analysis of errors and inadequacies follows.

a. The total permanent losses in acreages of forage and crops when taken from the sections on impact by individual companies only adds up to 225 acres. This figure is in contrast to the 9500 acres of permanently lost acreage presented on page I-542, making one wonder from what source the figures for the effect of individual mining operations was derived.

b. Again on page I-543 it is stated that "secondary impacts (on agriculture) associated with population increases due to construction, mining, and related developments will occur." However, no attempt is made to project what these losses might be in terms of lost Animal Unit Months (AUM's) or forage acreage. Considerable losses are occurring in Rock Springs where the population is living in inadequate housing on the rangeland surrounding the plants being constructed. On the same page, mention is made of what could happen to livestock production as a result of the construction of railroads and roads which alter established use patterns. However, none of this material is projected into actual

figures for summary purposes. It is obvious, then, that the summary figures in Table 14 are somewhat less than accurate. An impact statement should project probable impacts in terms of comparable figures, not just opinions.

c. On page I-545, it is stated that "some loss of livestock water is anticipated through change of land use or land severance." The question is how much water? Again, on page I-662 reference is made to "increased vandalism of livestock watering facilities" and drying up of livestock water sources." Again, what is the projected total in relation to available water for agriculture and that needed by industry? The only places that any water loss is addressed are on pages I-546, I-547, I-624 and 625, where figures are presented for projected cumulative loss of irrigated cropland due to water right conversion. While there are Tables for the number of irrigated acreages in northeastern Wyoming, principal reservoirs in northeastern Wyoming, estimated depletions of streamflow and tabulation of adjudicated acres, nowhere is there presented figures in acre feet which show the relation between loss of irrigation water to industry in relation to amount of irrigation water available. Yet it is repeatedly stated that "loss of water for irrigation could not readily be replaced from existing sources" and irrigation water is inadequate to supply current needs (I-547).

d. Again on page I-545, reference is made to the effect of increase erosion and sedimentation due to mining operations, but no definite acreages are mentioned. The only references to erosion control is one on page VI-109 for the Wyodak operation which states that "When feasible, erosion control and flood control structures should be built prior to starting excavation." (emphasis

added). The problem of erosion, which is an integral part of the mining operation is not sufficiently addressed.

e. The summary statement (I-547) that "the direct loss of agricultural land and production by 1990 would not constitute an important regional impact as lost production by that time is anticipated to represent one percent or less of the total regional agricultural production." is misleading because it fails to take into account the statement made in the preceding paragraph that six percent loss of irrigation water would represent "The loss of a source of winter feed to the livestock industry equal to 67,200 tons of hay in an area with a winter feed deficit." The cost to the ranchers of replacing this hay for cattle and sheep would be an impact indeed, especially when one considers Table 14 in which it is stated that for the entire region only 549 acres (1.62 tons/A) of irrigated annual hay production would be lost by 1990. When 590 tons of lost hay is multiplied by 15 years (period of 1975-1990), the resulting total loss is 12,235 tons. Certainly, a 67,200 ton hay loss is considerably greater than a 12,235 ton hay loss for the period. Actually it is not stated how much hay is produced by six percent irrigation water, so the reader is unable to ascertain the correctness of the figure 67,200 tons. No projected financial losses to the rancher are included. Additionally, in Table 15 (I-546), a figure of 31,473 acres of irrigated cropland is expected to be lost to industry through water rights conversion by 1990. If as presented in Table 14, irrigated pasture provides 1.62 tons of hay per acre, it follows that, in fact, by 1990, 50,986 tons of hay will be lost each year.

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f. In Table 5 (I-53), estimated irrigation water requirements are listed as 10,000 acre feet annually throughout the period 1974-1990. How can this be if on page I-547, it is stated that there is going to be a six percent loss of irrigated lands through water right conversion? In the summary statement (I-548), it is stated that "a projected six percent loss of irrigation water supplies and hence irrigated cropland production would not be considered to be a significant impact to overall agriculture within the study area." From whose standpoint is a six percent loss of irrigation water not considered a significant impact? The study area is not a large area and it appears that this statement is not based on fact.

g. In the summary (I-547) it is stated that "The direct loss of agricultural land and production by 1990 would not constitute an important regional impact as lost production by that time is anticipated to represent one percent or less of the total regional agricultural production." Where is the data to support this statement? What is the extent of the region being impacted--two counties, seven counties or three states? What is the extent of current agricultural production in the area of mining? According to II-159, Burlington Northern projects "a permanent loss of 2,400 acres of right-of-way" and 550 acres outside the right-of-way; Atlantic Richfield (III-119) indicates "grazing on the entire 6,524 acres of the mine area would be disrupted;" Carter Oil (IV-118) expects "grazing on the entire 4,352 acres of the mine area will be disrupted" and Wyodak (VI-89) indicates that "mining will remove 2,080 acres of grazing land from production." How much land is it necessary to disrupt in order to qualify as a regional impact?

h. On page I-539 it is stated that "Wyoming statutes provide for a change of water right to higher, preferred uses, with industry use rated higher than agriculture. Requests have already been filed with the State Engineer for changes in water use from agriculture to industrial use totaling approximately 1.5 million acre-feet." (emphasis added) On page I-501 it states that "requests have been filed with the State Engineer for changes involving one million acre-feet of water." (emphasis added) Which is the correct figure? Is this the 6% water right conversion mentioned on I-547? Table 15 states that by 1990 irrigated cropland that is projected to be lost cumulatively is 31,473 acres ("assuming 1.1 acre-feet of water is used per acre of cropland"). This amounts to 34,620 acre-feet of water rights converted. This is a considerably lower projected figure than water actually filed for. Question: What is the impact of three times as much water loss to agriculture in this "region?"

Why doesn't the EIS address the impact at this level of water loss rather than the much lower figure? On the basis of one million acre-feet of water right conversion, the figure of 67,200 tons of hay lost to the livestock industry by 1990 would, in fact, be 201,600 tons of hay lost.

i. On I-79, it is stated that "Based on the assumption that the best technology will be applied, an estimated 70 to 80 percent of the mined land surface would be expected to be successfully rehabilitated under existing climatic and soil conditions." Yet on page I-662 it is stated "The return of agricultural land to production after reclamation depends on rehabilitation success. To determine unavoidable losses, a five percent rehabilitation failure and 10

percent conversion to other uses was assumed." All of a sudden rehabilitation has been increased to 95% of the mined land surface. Is the 10% converted left out of the rehabilitation process? Just how many acres of mined land surface can we reasonably expect to be rehabilitated? If, with the best technology only 70 to 80 percent of the land can be reclaimed, how can one obtain 95% rehabilitation?

j. Agriculture in the area is dependent on water. A whole section (I-195) is devoted to water resources. However, the quality of underground water is not discussed nor is the possibility that it may contain elements toxic to existing agricultural production.

k. It is stated on Page II-114 that "an estimated 550 acres outside the right-of-way will be permanent loss (85 AUM's) due to access road construction, population increase and fire guards." In the next sentence it is stated that "the majority of this loss will be a temporary loss for the two-year construction period." Is it then a permanent or a temporary loss?

3. Mitigating Measures

There is no section on regional mitigating measures for agriculture. It is stated on I-459 that agriculture is one of the most likely components to be affected. Considering the probable severe impact on agriculture of the region due to the mining operations and especially water right conversion, it seems incredible that mitigating measures are not discussed on a regional basis.

Mitigating measures are covered to some extent under separate coal company proposals. The proposed measures seem reasonable but no attention is paid to the necessity of water for reclamation purposes. On page VI-111, reference is made to mitigating the

effect of mining on farming. No reference is made to finding new sources of water to maintain any level of agriculture.

Measures that should have been included in this section are as follows: a) measures to see that water converted to industry is not permanently lost to agriculture, by returning water rights to the state for agricultural use after termination of the industrial operation; b) industry should be encouraged to explore for deep underground water, which according to page I-257 is present in great abundance in the tertiary formation underlying the Powder River Basin; however, strict control of such use must be exercised to insure that surface water is not affected or the water table lowered; c) it may be necessary for the state to mandate that agricultural water must stay with the land; the state of Wyoming should also urge that companies lease back to the landowner the land and water until such time as it is needed by the company or the company must farm the land itself, to insure that not more agricultural land than is necessary is taken out of production.

4. Probable Adverse Environmental Effects Which cannot be Avoided.

The thoughts presented in this section are well taken, as far as pointing out what is to be unavoidably lost. However, the perspective taken on the rate and scale of development, considering the lack of discussion on mitigating measures, resulted in conclusions in the EIS that a great deal was "unavoidable."

The number of errors and inconsistencies in the text often make a realistic evaluation of unavoidable adverse impacts very difficult. The discussion of reclamation and productivity is one example of this. As previously noted, the discrepancy in degree of possible

rehabilitation, implied at one point to be 95% but at another technologically feasible only to 70% to 80%, it further confused with the statement on Page I-523 that the total vegetative cover, "...considering failure-success reclamation probabilities," will be greatly reduced "...to probably near 50 percent of that found on adjacent undisturbed range." Thus, it would appear that the unavoidable adverse effects are greater than those estimated in the EIS.

Another example of confused figures are those presented on hay loss and AUM's. There are at least three different figures presented for annual hay loss due to loss of irrigation water for the period 1975-1990: 12,235, 50,986, and 67,200 tons. The highest figure is based on a loss of 13,200 acre feet through water right conversion to industry (I-547). However, the projected unavoidable losses of AUM's presented on page I-662 are based on the lowest figure of 12,235 tons (549 tons annually as found on Table 14, I-544). More confusion arises in the figures for water rights on file with the State Engineer, which varies from one million to 1.5 million acre feet. It is also unclear how much of this water filed upon will be converted from agricultural use and how much is inappropriate water. The figure for water lost to industry (13,200 acre feet) is then called into question, which also affects the hay loss and the loss in AUM's. This is one example where unclear or misused figures can compound discrepancies in figures, and thus greatly effect the final evaluation of unavoidable adverse impacts.

5. Conclusions and Summary

The sections dealing with agriculture are inadequate. While the information provided is taken from statistical summaries of

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various state agencies, little of it directly lends itself to an analysis of the impact of coal mining on the Powder River Basin. The sections are replete with errors, both mathematical and grammatical. Conflicting statements concerning the impact of mining on agriculture appear at various places in the text, often in sections unrelated to agriculture. Figures presented in the tables do not always correspond with the information presented in the text.

Additionally, the text is often difficult to follow and information hard to find. For example, on pages I-619 to I-636 appears a section entitled "Resource Disturbance." In actuality this section refers to strip mining reclamation. A number of good ideas are presented but little emphasis is placed on the ultimate use of this land in an agricultural framework. There are also a large number of excellent scientific papers dealing with strip mine reclamation, but very few are referred to in the text of the EIS, pointing to the narrow information source from which this EIS was developed.

Matters important to agriculture were often not discussed at all. In the mining proposals, for instance, location, mileage, and type of roads were not discussed in detail, as well as what agricultural lands do they cross and the actual extent of the impact on agricultural production by separating agricultural lands from water sources and disrupting established patterns of use.

TABLE 1: A Summary of Losses of Pasture, Farmland and AUMs*

Company	Permanent loss - forage in acres	Permanent loss - farmland in acres	Permanent loss - AUMs	Destruction of critical pastures	Yearly loss AUMs	Water loss (numbers)		
						Wells	Springs	Reservoirs
Burlington Northern RR	1,995	168	600	505	--	-	-	-
Atlantic Richfield	310	---	78	4,440	--	0	0	3
Carter Oil	740	355	185	4,120	518	4	1	6
Kerr-McGee	200	0	50	4,352	544	0	2	5
Wyodak	1,960	170	243	-	160	1	0	4
TOTAL	6,225	693	1,156	13,417	1,222	5	3	18

*Taken from individual descriptions of probable impacts of coal companies,
Volumes III and IV, BEIS

H. Land Use Controls and Constraints

Extensive changes in land tenure and patterns of land use will be one of the major impacts of the Powder River Basin coal development. Therefore, land use planning and other efforts designed to mitigate these changes are of extreme importance.

1. Adequacy of Description of Environment (present conditions)

In the Regional Analysis, aside from a very brief discussion of land tenure, there is no comprehensive description of present land use patterns. In the portions of the EIS dealing with the railroads and mines, there is absolutely no discussion of land use planning as it relates to these specific developments.

Although most entities controlling land use (federal, state, and county jurisdictions) have sufficient authority to impose effective land use controls, the level of commitment to do so varies a great deal (EIS, I-391). This assessment of the present situation is accurate, and is emphasized by the fact that only one of the counties in the region is moving toward development of a county master plan (I-390). Although the EIS does state that nearly all of the cities have master plans and zoning ordinances (I-390), there is no discussion on the adequacy of these plans to meet the problems brought on by the development.

2. Analysis of Accumulated Regional Impacts

Since there is no discussion of present land use patterns, there can be no assessment of the impact the development will bring. Nor can there be an assessment of what sort of burden will be placed on the counties and cities to develop needed planning and controls within the time frame of the increasing pace of develop-

ment. And since only one of the counties has proceeded to develop a master plan, the impact of the developments on unprepared county governments must be evaluated. Another glaring error is a lack of any discussion on available financing to fund planning and control efforts. Finally, the extent to which each jurisdiction can effect needed planning and land use controls has not been evaluated.

3. Mitigating Measures

The discussion of mitigative measures and techniques lacks specificity as to who the communities in this region can deal with the impending development, such as development of adequate subdivision regulations. Nor is there any discussion of measures that can be taken by the State to control the pace and direction of the development (i.e., Energy Conversion Facility Siting laws).

Although the alarming figure of 60,000-100,000 acres in two counties passing from private to corporate interest is cited (I-553), there is no discussion of what effect this will have on the local economy nor of how to control this change.

4. Adverse Environmental Impacts

Although throughout the EIS, adverse environmental impacts are obviously discussed, there is no attempt at integration of this information to show the specific environmental impacts that would result directly from changes in land use patterns.

I. Review of Socio-Economic Analysis

1. Description of Existing Environment

Despite the fact that a large amount of data on socio-economic conditions is presented in the EIS, it suffers from several major omissions.

First, the statement falters between being a Regional description and site-specific descriptions, doing a good job of neither. An adequate Regional description should include specific facts, especially financial information, on the major sectors of the regional economy including tourism, agriculture and industry. Consideration should have been given to the consequences of shifting from a predominantly agricultural economy to an industrial economy. The possibility of a "boom and bust" development of coal should have been analyzed. Short term and long term behavior of the regional economy should have been projected since it is almost certain that the coal development will diminish in the relatively short run -- 40 to 50 years.

The statement suffers from hasty preparation as evidenced in two ways. There are numerous minor and not so minor errors in the data presented. For example, paragraph 4, I-407, Vol. 1 states there are 3,937 year-round housing units in Campbell County. The next sentence states there are 6,982 year-round housing units in Gillette and 5,683 housing units in rural areas for a total of 12,665 housing units in Campbell County. Such errors make the reader very wary of all the data presented. Also, there are a number of socio-economic studies available, such as the Northern Great Plains Resources Program Studies,

which could and should have been utilized in the statement.

Finally, the most serious omission is the exclusion of any cost-benefit figures for the changing social service needs which will be caused by the proposed activities. The EIS simply will not have fulfilled its function until such financial data is acquired.

The section on health and social services is inaccurate and misleading in some areas. For example, on I-433 it is stated that, "With 31 acute beds and 125 extended care beds, Campbell County is in a good position to provide an acceptable level of service to its present population." In fact, Campbell County has a serious medical service problem. The bed excess claimed in Table 62, I-432, is a result of the fact that Campbell County only has the equivalent of 2 1/2 functioning doctors. Utilization rate of the hospital is artificially low because upwards of 30 percent of Campbell County residents go to Casper, Buffalo or Sheridan because of the shortage of physicians.

This relationship of physicians to hospitals reveals a circular problem which is going to affect Campbell County's efforts to recruit new doctors. Young doctors exhibit a strong preference to belong to a group practice. (See the Campbell County Memorial Hospital, Feasibility and Site Development Study by Gerhard Hartman, 1973.) But the Campbell County Hospital is neither large enough nor well-enough equipped to accomodate 3 to 5 new doctors in Gillette. Therefore, new doctors will be hard to recruit until a new hospital is built. But opponents of a new hospital point to the unused capacity of the present hospital as evidence a new one is not needed.

The above illustrates that this section of the statement was developed using only superficial and dated secondary data. If the researchers had gone into each county and personally interviewed they would have discovered that the situation for most health and social services is quite different from the situation they have described. The following quote indicates that the authors of the statement also had differing views of the adequacy of social services:

The practical consequences of rapid development have seriously affected the residents of this area. A shortage of vital public services, including water, sanitation facilities, housing, schools, medical services and recreational outlets, has strained both public officials and citizens alike. This stress has been reflected in the increasing incidence of family discord, adjustment problems, truancy and alcoholism.

Yet most of the description of this section on health and social services claims there are few, if any, shortages in these public services. A survey of attitudes toward public services, on the other hand, was summarized as follows for Campbell County:

Attitudes toward five public services (medical, schools, recreation, police and postal services) showed respondents were somewhat dissatisfied. On a five point scale running from one for high degree of satisfaction, three being neutral, to five for high degree of dissatisfaction, the following scores were recorded: medical services, median = 3.959; schools, median = 2.126; recreation, median = 2.939; police-sheriff; median = 2.432; and postal services, median = 2.154. Respondents were satisfied with schools, the postal service and police sheriff; neutral on recreation; and dissatisfied with medical services. Only six percent were very satisfied while 31 percent were very dissatisfied with medical services. With regard to school service, 19.6 percent were very satisfied while only 3.8 percent were very dissatisfied. Efforts should be expended to improve medical services in Gillette and Campbell County." (Survey conducted by the Dept. of Sociology, University of Wyoming.)

2. Probable Impact on Socio-economic Conditions

The complete omission of all cost and revenue figures for impacted areas is the most glaring deficiency of this section, Vol. II, I-554 to I-611. It is hard to imagine how an economic study could contain so little financial data.

This section of the statement flounders between being a regional analysis and a specific analysis of the proposed actions. In light of this, two levels of economic study should have been conducted. One would have been a regional analysis of the changes in major sectors of the economy, i.e. agriculture, tourism, industry, etc. phrased in specific financial terms. The other should have been an extrapolation of costs and benefit figures for each social service area attributable to the specific actions under consideration in the EIS.

The section on population, Vol. II, I-565 to I-569 is so disorganized that it is almost impossible to understand how the population projections were made. Only by reading I-1 to I-6 of Vol. I can the reader learn which proposed actions were supposed to have been included in the projections. Close examination, however, reveals that either not all of the "supposed-to-be included" actions were included or the statement contains gross arithmetic errors in the calculations.

To perform a close examination, the reader has to discover that the only listing of basic employment for each activity on which the population calculations are based is Map 6 in the Appendix. The listing is not referenced in the population section. The following table is a summary of the figures contained in Map 6. This should be included in Chapter I of Volume I of the EIS.

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TABLE I

	<u>Permanent</u>	<u>Construction</u>
<u>Campbell County *</u>		
Atlantic Richfield Co.	400	200
Carter Oil	1000	2700
Kerr-McGee	225	200
Wyodak	190	1480
Belle Ayre South Mine	250	100
Rochelle Mine	225	250
Rochelle Gasification Plant	800	2500
Belle Ayre North Mine	325	100
Subtotal	<u>3,415</u>	<u>7,530</u> — 2.5
<u>Converse County</u>		
P.P. & L. Mine	<u>200</u>	<u>150</u>
Total	<u><u>3,615</u></u>	<u><u>7,680</u></u>

* No employment figures are included in the table for the proposed railroad because there were no figures for the railroad on Map 6.

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How total population figures were derived from the basic employment figures contained in Map 6 is unclear. The only explanation of this process is contained in Paragraph 3, Vol. II, I-566, which reads as follows:

Impact on other residentiaries is a direct function of population and employment in the basic sectors (only construction and other residentiaries are considered nonbasic or secondary). Although a precise numerical relationship does not exist between employment in the basic sector plus construction and employment in other residentiaries, a range can be made. On a regional basis (Table 45, Appendix C) for the years 1970 through 1990, the ratio of basic plus construction employment to total employment ranges from .35 to .37. Thus, one additional employee in a basic sector (coal, etc.) induces a total employment of 2.7 to 2.9 persons, the difference being attributable to other residentiaries. The figures are not as important as realizing for each employee in coal mining, coal gasification and power generation, more than two employee positions are induced in other residentiaries." (Vol. II, Paragraph 3, I-566).

One of the major points of nonclarity in the above is how construction workers were treated in making the calculations. This second sentence groups the basic sector alone and construction and residentiary together. The third sentence groups basic and construction in comparison to total employment.

But no matter how one treats construction employment, no calculations using the ratios indicated in the above quoted paragraph yield the population figures used in the EIS.

If an employment multiplier of 2.8 were used to calculate total employment, and a population multiplier of 3.2 were applied to the figures in the above table, the new population in Campbell County would be 98,067 by 1980. Old plus new population would equal 110,664 in Campbell County by 1980.

It should be obvious the above figures are too high.

Therefore, if it is also obvious the figures in the EIS either were not calculated the way it says they were, or serious arithmetical errors were made.

The following table calculates the population for the described developments as recommended by the latest DEPAD report, Coal and Uranium Development of the Powder River Basin - An Impact Analysis. This method is good because it makes clear each step in the process. Also, the care with which this method has been developed assures that the resultant figures are realistic. If anything the DEPAD method has a tendency to estimate low -- the assumptions causing this tendency are spelled out on pages 51-59 of that report.

Population Estimate for Campbell County
1980

	<u>Employment</u>	<u>Population</u>
Permanent Employees	3,415 ¹	8,537.5 ³
Construction Employees	7,530 ¹	15,060.0 ⁴
Induced Service Sector Employees	7,005 ²	<u>17,512.5⁵</u>
TOTAL NEW POPULATION		41,110.00

¹ Given - from Table I above

² Induced Service Employment = permanent employment x permanent service multiplier + construction workers x construction service multiplier
(3,415 x 1.50 + 7,530 x .25 = 7,005)

³ 8,537.5 = permanent employment (3,415) x permanent population multiplier (2.5)

⁴ 15,060 = Construction employment (7,530) x construction population multiplier (2.0)

⁵ Service workers are treated the same as permanent employees since they will establish permanent residences (17,512.5 = 7,005 x 2.5)

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When the new population estimate (41,110) is added to the present population (12,597), the total population for Campbell County for 1980 is realistically estimated to be 53,707 as opposed to the statement's projection of 32,200.

It must be stressed that the above total population figure is in no way inflated. That the EIS makes such a gross error in its estimation makes it clear that at least the population section of the EIS must be redone.

There are good reasons for thinking that even a 50,000 + population figure will be a low estimate for Gillette by 1980, because there are strong and persistent rumors of additional coal-related developments which are not included in the EIS and because the basic figures were furnished by the companies themselves and are probably conservative. For example, it is interesting that ARCO would need 400 permanent employees to mine 10 million tons annually while Kerr-McGee would need only 225 permanent employees to mine 16 million tons annually.

Since the impact in all of the socio-economic areas discussed in the EIS are dependent on the accuracy of the population projections reviewed above, it is clear this section needs to be entirely redone after corrections in the population projections are made.

Even accepting the projections of the EIS, however, there are serious errors or omissions in the descriptions of many of the areas of impact. Because 90+% of the described impact occurs in Campbell County; the following analysis is limited to that county.

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a. Housing - The description of housing is generally adequate but there are certain omissions. Tax revenues from mobile housing should be contrasted with revenues from conventional housing. If there are substantial differences, county officials should be made aware of it. Given the extent of mobile housing likely to occur, much more information on mobile homes should be included on existing construction standards in Wyoming, location of large mobile home parks and service problems of mobile home parks in Campbell County.

b. Public Education - Cost and revenue figures need to be calculated for demand for addition public education. The number of new classrooms can be calculated and price determined for them. Teachers' salaries and other expenses to the school district can be calculated. These costs should then be contrasted with additional revenues the school districts will receive from the proposed activities.

c. Health and Social Services - This section is seriously misleading as it is based on outdated information and contains errors with regard to facility needs. For brevity, only Campbell County is to be used as an example.

In 1974 Campbell County had 5, not 7, physicians. But members of the hospital board and the hospital administration staff indicate they actually have only the equivalent of 2 1/2 functioning doctors since three of the five have physical ailments which limit the work load they can carry. Also, the average age of the physicians is over 55 with two of the five being over 60. Several of the five would like to slow

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down and partially retire. Thus the problem of physician shortage is much more acute than the EIS indicates.

The computation of hospital facility needs is strangely remiss. According to Table 62, Campbell County will need 45 to 50 new acute hospital beds by 1980. The county will need most of these new beds by 1978 which is when the population will peak in the county for the five year period. Therefore, the bed shortage for Campbell County will become serious within three years. To lump together estimates for all hospital facilities for the eight counties when most of the population will live in one county is a serious error.

d. Mental Health Services - The Northeastern Mental Health Center in Campbell County is also likely to have trouble continuing to provide the level of services in the past. Approximately one-third of its budget is from a Federal grant which expires in 1975. Given a population increase of 40,000+ the center would need approximately ten new staff members just to continue the level of services it now provides. Even if the county could provide the salaries for that many new staff, it would be very hard to recruit the trained, qualified individuals needed.

e. Social Services - The EIS does note that the Division of Public Assistance and Social Services will suffer a load increase. However, it states that "...although the public assistance function will not be seriously affected by rapid mineral-related development, certain isolated impacts may occur." (I-594)

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The public assistance function did increase sharply during the oil boom. When word of a boom town becomes widespread, many people will continue to come to the area after the new job surplus is taken up. Often these people will require public assistance in order to move or to hold out until jobs open up.

Given the number of new jobs being proposed, the budget for public assistance may have to be greatly increased.

f. Law Enforcement - Again, cost and revenue figures are the most needed information and are not provided. Staff at Campbell County Sheriff's office have indicated they are already having trouble keeping employees because they cannot match the salaries of the energy companies. Also, law enforcement personnel with sufficient training are hard to find at any salary.

g. Water and Sewage - Analysis of system capabilities in Gillette is reasonable. But nowhere is it more obvious that cost and revenue figures are necessary to give any idea of the extent of impact. Both the water and sewage system will have to be expanded by 1985. The critical question is whether sufficient revenue will be developed by the proposed developments, and if so, when it will be available.

Analysis of water and sewage problems for Campbell County is completely lacking but very necessary.

Two large mobile home parks have been publicly announced for construction at Reno Junction. There will probably be more such developments between Reno Junction and Gillette requiring both water and sewage treatment. Information on sanitary

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problems, water supply, subdivision regulations, etc. regarding mobile homes needs to be included in the statement.

3. Mitigating Measures for Socio-economic Impacts

The complete exclusion of mitigating measures for socio-economic impacts in Chapter IV, Vol. II is puzzling. Was this section left out by oversight or a printing error? Or is it believed that nothing can be done to mitigate socio-economic impacts?

A number of activities could be undertaken to help mitigate socio-economic impacts, a few of which are listed below. The EIS should certainly contain a section in this area.

a. Impacted communities will need additional revenue to try to prepare for population increases. Possible sources for revenue should be identified. Minor obstacles to communities receiving revenue should be identified so they can be removed, particularly if they require legislative action.

b. State government needs to devise a means for forcing development companies to divulge their plans ahead of time to enable communities to make preparation, and a means of recourse if estimates of development are given falsely.

c. A means of slowing down the rate of development in particular areas needs to be implemented. Campbell County will receive the lion's share of the burden of providing public services for the activities proposed in this EIS and will receive the majority of that burden in a very condensed time period -- three to five years.

There are many other actions which could be taken to mitigate

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the socio-economic impacts. Under the NEPA requirements this EIS is required to discuss those actions.

4. Probable Adverse Environmental Effects

This section simply states that the quality of almost every public service in the heavily impacted communities will seriously deteriorate and this cannot be avoided. This conclusion of unavoidability is incorrect. The purpose of this section should be to identify what adverse effects can be avoided and how, and then to identify what effects really cannot be avoided and estimate to what extent they will occur. Then decision makers could have some idea of what the socio-environmental costs are going to be and if the value of the proposed developments justifies these unavoidable costs. Fortunately most of the adverse environmental effects could be avoided or at least mitigated if responsibility would be exercised by Federal and state decision-makers.

The most significant factor is time. Given the development schedule in this EIS, no amount of effort can prevent serious community deterioration in at least two communities. But the simple realization either by corporate or government decision makers that slowing the rate of these developments is very important could help to minimize the adverse impacts.

The second factor is money. Given some relief in time schedule and plenty of start-up money, communities could prepare so that little adverse impact would occur.

In fact, there is the strong possibility that the communities could be improved. But it will require very explicit de-

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cisions regarding the two factors for a desirable effect to occur. On the other hand, if these two factors are ignored, then several communities in the Powder River Basin could be seriously damaged. Once public services start to deteriorate, the process compounds, affecting other areas. If additional doctors are not recruited before 1978, the pressure on those doctors in the area will increase, perhaps influencing them to retire or move elsewhere. The same is true of staff in all the public service areas; their skilled services are in high demand in other parts of the country, and if the conditions of their employment become intolerable, they can and will leave.

The EIS should relate the different social impacts using the coordinates of time and money. Then the different possibilities for social impact become apparent, and serve as a guide for policy making. Simply stating that impacts are unavoidable is the wrong way to handle the problem. All such impacts are avoidable to a degree and this degree is the important information that should have been included in this section.

5. Conclusions

The most serious deficiency in the socio-economic sections is the lack of financial information. The EIS should be revised to include this information.

Regional analysis of the economic sectors is almost nonexistent. In particular, analysis of the long-term meaning of the decline of the agricultural sector should be developed.

Population estimates need considerable work. All employment figures, including all development, should be arranged in one table. The estimation procedures should be clearly spelled out

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so the accuracy of the calculations can be verified.

The sections on Health and Social Services are inaccurate and incomplete. More specific information should be collected, especially for Campbell and Converse Counties.

The sections on housing should include more specific information on a number of facets of mobile housing as mentioned in the above review.

V. ALTERNATIVES

The following is a free-handed review of some interesting comments and unanswered questions included in the EIS in the Alternatives section.

A. Alternatives to Proposed Development

This section offers some interesting alternatives to the proposed development in the Eastern Powder River Basin, e.g., "A Delay Pending New Technology," "In Phase and Staged with Socio-economic Development" and "Control Location of Depletion by Designating the Area for Production," which includes protecting areas of unique resource value other than coal. There are three small questions which might be answered:

a. Gasification is heralded as being environmentally acceptable, but by whom? Gasification plants impact water resources, open space, and human resources, and may pose serious environmental hazards.

b. The EIS states: "Thin coal beds mined by surface or underground methods would likely require larger machinery to strip to maximum depth and greater numbers of employees -- thus increasing impact in the industrial and socio-economic frames." This statement needs documentation.

c. The statement made on page I-672 is unjustifiable; there is no reason for the government to assume the burden of commitments made by private industry before they had clearance to proceed with mining.

B. Alternative Extraction Methods

The section on I-682 is negative towards underground mining. Surface mining, however, has great effects on hydrology and

dust problems of at least equal magnitude, if not greater, than underground mining. In addition, the impact of drilling and blasting was not discussed in the surface mining alternative.

C. Alternative Reclamation Objectives

There are many problem areas that need clarification within this section.

1. The EIS states on I-688: "A less diversified vegetation, possibly a monoculture suitable for livestock forage, would be established. This would limit wildlife diversity and would be less attractive for recreational purposes." Other problems associated with a monoculture need to be articulated in the EIS: drought, pests and disease, for example.

2. In the wildlife section no mention is made of fish and aquatic habitats.

3. The paragraph on I-690 on recreation is extremely contradictory. It lists undesirable impacts from increased recreation (litter, erosion, noise and dust from ORV's) and yet states that, "this alternative could provide sorely needed opportunities in the event population growth becomes significant in the area." This is an example of outdoor recreation planning at its worst.

4. On I-692 multiple use is described glowingly as "optimization of the various uses in harmony with land capability." It is ironic that the EIS statement never considers restrictions of development on a "multiple use" basis.

D. Alternative Mode of Distributions

1. The alternative "to return the water via a separate pipeline to the basin for reuse " is certainly a viable alternative.

2. The 19 transmission lines required would be a visual distraction as well as occupying 16,400 acres of right of way. The alternative of underground lines is not considered. While there are arguments as to why this method is not economically feasible, neither pro or con arguments are presented.

E. Alternative Sources of Energy

This is an intriguing section which does not fully represent the situation regarding alternative sources of energy. Alternatives are merely examined "to the extend present technological development permits."

1. Table 3, I-709, does not list the potential yields of solar, wind and geothermal energy.

2. The section on production from outer Continental Shelf sources emphasizes delay, but there will also be delay associated with coal production.

3. On page I-710 there is the statement that by 1985 "1.5 billion barrels of oil will be produced which is approximately 16% of total projected national energy requirements." How does this relate to the coal development in Wyoming?

4. Nuclear simulation for natural gas is presented unrealistically; Project Rulison (Near Rifle, Colorado) did not clearly demonstrate that recovery of natural gas by nuclear explosion is technically feasible and economically promising. In fact, the gas became contaminated and the project was abandoned. Furthermore, the Rio Blanco reports are speculative at this point.

5. Coal -- Nationwide

The description of western coal should include an analysis of the value ^{of western coals} of western coal compared to the value of eastern coal. For

example, is the 18% resource listed for Appalachia on a tonnage basis? What would it be on a Btu basis? A measurement of 0.7% sulfur is listed for bituminous coal as the percent content to meet the emission standards for sulfur dioxide of 1.2 pounds per million Btu's of fuel burned. What is the average per cent sulfur for subbituminous coal to meet standards? On the basis of Btu content, eastern coal reserves of low sulfur coal far outweigh western reserves. It takes half again as much western coal on a tonnage basis to equal eastern coals and this increases the amount of sulfur released per million Btu's generated. This fact places most western coals in the medium sulfur category when measured by emission per million Btu's generated. Finally, the coal mining labor force is established in the east and is not established in the west. Present mining in the west is not going to totally move to the east and even if it did the number of present workers is small. Is the larger stripping average figure of 4.5 times based on recovery of tons or equivalent Btu values with western coal? The last sentence on I-805 is not documented; there is much low sulfur coal in the east.

6. In the discussion on nuclear power there is an assessment of risk conditions. However, there are no comments about the definite possibilities of sabotage on plants, and theft of nuclear materials (in transit) to build nuclear devices. These are surely high risk situations.

7. What are the technical and economic constraints on geothermal energy development? They are not explained.

F. Energy Conservation

This discussion appears to be a parroting of administrative and executive dictum towards superfluous conservation measures which never get to the root of the problems of our overly energy consumptive society. Two conservation measures that have been overlooked are greatly increased research funds for the so-called "exotic" energy resources and tax incentives to encourage development of these energy resources.

G. Other Energy Sources

This section, more than any other, demonstrates a purely negative attitude of condemnation of the "exotic" resources, as shown in the following quotes:

Other energy sources that might in the future be alternatives to coal are not presently considered viable because production technology is not developed, and time for development would be measured in several years or tens of years.

No appreciable energy can be obtained from these systems within a relevant time frame.

1. Wind Energy

No source is given for the estimates of the ultimate energy potential of wind energy. More data should be given, for example on the size of the energy storage facilities rather than saying, as the EIS does, "Wind forces vary unpredictably at many locations thus requiring large energy storage facilities for any sustained use of wind energy for power."

On I-849 the EIS states "The primary adverse environmental effect [of windmills] would be damage to aesthetic values." How does this compare with disturbances caused by other energy conversion facilities (power plants, gasification, etc.), and

just how major an environmental impact would this be?

Experts believe that wind power is a viable alternative. A committee appointed jointly by the National Science Foundation and the National Aeronautic and Space Administration has suggested that by the year 2000, less than three decades away, a major American development in wind power could result in an annual yield of 1.5 trillion Kilowatt-hours of electricity. That is equal to the total electricity consumed in the United States in 1970." (See "Return of the Windmill," Smithsonian Magazine, November, 1973, reprinted in the May 24, 1974 issue of High Country News.) Smithsonian Magazine went on to state, "NASA officials believe that with mass production, electricity generated by wind power will be available at capital costs which a decade from now will be competitive with nuclear plants."

2. Solar Energy

Solar energy also has potential as a viable energy resource.

But the EIS takes this view:

The requirement for large collector areas and the low efficiencies make it unlikely that solar energy will become an important source of power within this century. Even a 300 percent increase in solar cell efficiency would not result in economically acceptable power costs for general use."

What is an acceptable power cost?

3. Recycling Organic Wastes

This section is contradictory. One statement (I-851) praises the potential for this energy source, "Organic wastes in the U.S. are potentially a source of appreciable energy," and then a damper is put on the entire prospect by stating, "It seems likely, however, that only a small fraction of the

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organic wastes could be collected at a reasonable cost." (This is for conversion to oil.) The EIS does not consider organic wastes as a fuel source for power plants, but in fact, cities are now burning garbage to meet their energy demands.

The "Combination of Alternatives" section does not mention the energy from wind, solar or organic wastes.

H. Conclusion

Why are nuclear reactors, coal gasification and liquefaction, liquid natural gas, and oil shale retorting processes with all their environmental drawbacks "important, environmentally acceptable energy conversion systems?" This is an irresponsible statement to say the least.

The conclusions of this statement underline the inherent bias towards the traditional coal extraction scenario by saying: "In view of the trends and problems discussed above, it seems reasonable to postulate that for some time to come the best alternative to the production of the coal from the Eastern Bowder River (Coal) Basin of Wyoming would be to produce an equivalent amount of similar coal from elsewhere in Montana, Wyoming or North Dakota. (emphasis added)

VI. SUMMARY OF THE MAJOR CONCLUSIONS OF THE DISCIPLINARY CRITIQUE

A. Climatology and Air Quality

1. Extremes of precipitation in the Powder River Basin are not properly emphasized in the EIS. In about five out of ten years, the Powder River Basin receives less than ten inches to total precipitation.

2. Atmospheric observations conducted in the Powder River Basin suggest that there will be one pollution episode lasting at least six months each year.

3. An amendment of the Wyoming Air Quality regulations is needed to stipulate that not only the amount of allowable particulate matter from stack emissions be delineated, but also that the composition of the emissions be identified.

B. Soils

1. Research data suggest that the handling of soils which will be directly impacted by mining must be quite different than as suggested in the EIS.

2. There is no basis for proposing there will be an increase in land productivity except during the early period of reclamation when there is a high degree of stewardship of the land. The destruction of the soil nutrient storage balance eventually results in very sterile soil conditions.

C. Geochemistry; Mineral and Trace Elements

1. The EIS is incorrect in saying that the overburden does not contain any toxic materials. There are possible problems with concentrations of boron, molybdenum, beryllium, cadmium, and selenium.

2. The effect of the proposed mines could be an increase in

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salinity levels of surface water to a level which would make the water unsuitable for livestock and wildlife use.

3. The EIS should address the problem of acid rain resulting from sulfur dioxide (SO_2) release from generating plants and gasification plants.

D. Water Resources

1. The lack of data in practically every area of water use forces the EIS to the conclusion that impact on water usage in the Powder River Basin simply cannot be assessed at this time.

2. The EIS is wrong in stating there is a recharge rate of 150,000 acre feet of ground water annually. The latest Wyoming Water Plan shows 100,000 acre feet or less. Further, only hydrological ignorance could account for the idea that 100,000 acre feet recharge means that wells in one area can withdraw that amount without causing major disturbance of the water table. The relation between recharge rate and changes in the surface drainage system is much more complicated than the EIS indicates.

E. Biota

1. The description of the existing biota is inadequate since there is little or no information included in the EIS on the following: a) vegetation productivity; b) accurate population estimates for most species of vertebrates; c) quantitative and qualitative data on any invertebrates; d) qualitative and quantitative data on soil organisms; and f) population estimates and distributions of threatened species.

2. The population data which are presented are only for one season and/or one sampling time.

3. The tolerances and resource requirements and extent of the interactions between even the major species are unknown. Until further information is available, the impact of development on the ecosystem will be impossible to assess.

F. Aesthetics and Recreation Resources

1. The EIS accurately evaluates potential impacts that will come with large scale industrial activity. The most important impact is the gradual loss of large open spaces as a specific resource. Too many people on a finite land base, even in Wyoming, will close the open spaces and degrade the quality outdoor recreation experience.

G. Agriculture

1. Discrepancies between numbers presented in Tables and numbers presented in the body of the text occur frequently throughout all the sections on Agriculture. Such errors are so frequent that the text simply cannot be accepted as a reliable base of information.

2. In the section on "Probable Cumulative Impacts," no attempt is made to project impact effects into actual numbers, the units of which are comparable in all cases. Hence, the data presented are unusable in assessing the regional effects of development.

3. Incredibly, mitigating measures are not discussed on a regional basis. Mitigating measures are discussed to some extent under separate coal company proposals. However, even these analyses pay no attention to the necessity of water for reclamation purposes.

4. The discussion of reclamation ("Resource Disturbance") put little emphasis on the ultimate use of the land in an agricultural framework. It also utilized a very narrow information base compared to that readily available in the published literature.

5. Many effects of development which may have a detrimental effect on agriculture were not discussed in detail (e.g., location, mileage and type of roads, the effect of separating agricultural lands from water sources, and disrupting established patterns of use).

H. Land Use Controls and Constraints

1. Because there is no comprehensive description of land use patterns in the EIS, there is no way to assess what accumulated regional impacts might be. An acceptable analysis of land use patterns remains to be done for the EIS.

I. Socio-Economic Analysis

1. The EIS has not conducted an economic analysis. Cost benefit analysis should be done on both a regional basis for sectors of the economy and at the community level for public services.

2. The population estimates are incorrect and understated. The data must be rearranged and completed so correct estimates can be done.

3. Information on Health and Social Services is superficial and inaccurate. The EIS presents a false picture of the status of these services in Campbell County.

VII. RECOMMENDATIONS

As stated in the introduction, the Reviewers believe that the EIS should be rewritten, additional public hearings held, and a moratorium instituted on agency decisions for at least two to five years.

Draft revision and new public hearings are especially important to individuals and groups in Wyoming where the impacts will occur and the majority of costs will be borne.

Public hearings are our most direct opportunity to influence agency decisions. A revised draft, which at a minimum should cover the critical factors enumerated in this review, will give us the knowledgeable base for registering our approval or disapproval at the point in the decision-making process where our input is particularly critical for use in making decisions on the future of the area.

The Reviewers are concerned that information from the Northern Great Plains Resources Program has not received sufficient recognition and/or inclusion in the five-volume EIS. Members of the Review Team have participated in NGPRP and reviewed several of the draft reports. There is much valuable information that bears directly on the regional analysis, impacts, mitigation, and alternatives described in the EIS.

In the national context of coal development, the Reviewers are not convinced that decisions by the Department of Interior or the other participating agencies will give any more attention to critical areas than does the impact statement on the Eastern Powder River Basin.

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Considering the strip-mine legislation which passed the House and Senate, there needs to be a total revision on the impact statement's assumptions for controls, planning, and mitigation. The agencies need further to do research on mitigation measures which should be written into mining plans and other administrative decisions, assuming a decision might be made to approve actions in the vicinity of Gillette.

At this point in time, the Reviewers do not think it would be in the public interest to approve any development in the central part of the Powder River Basin between Gillette and Douglas. This would commit a vast area to coal development without a knowledgeable base for the decisions. The EIS has but pointed up these many information gaps, stating numerous times that environmental impacts of various developments cannot be predicted.

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COMMENTS OF THE
NATURAL RESOURCES DEFENSE COUNCIL, INC.
ON THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT
DEVELOPMENT OF COAL RESOURCES
IN THE
EASTERN POWDER COAL BASIN
OF WYOMING

Submitted By:

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August 2, 1974

These comments are submitted by the Natural Resources Defense Council, Inc. (NRDC) through its office in Palo Alto, California. NRDC is a non-profit, tax-exempt, corporation organized under the laws of the State of New York, with offices in Palo Alto, New York City, and Washington, D.C. NRDC is a national organization dedicated to the wise management of the nation's natural resources and the enhancement of environmental quality. It has about 20,000 members and contributors in the United States. Among the methods NRDC uses to achieve its objectives are: (1) monitoring the activities of federal and state governmental agencies to make sure that environmental values are fully considered in decision making; (2) improving agency decision making which affects the environment by submitting written comments on agency programs, participating in administrative proceedings, and filing lawsuits where legal duties are not being fulfilled; (3) providing information and assistance -- both legal and technical -- to individuals and organizations interested in making governmental agencies more responsive to environmental values.

INTRODUCTION

Though more frank and detailed than most, this draft impact statement is still inadequate to perform its primary function. The central purpose of section 102 of NEPA is to provide the decision maker with the clearest possible picture of the ultimate environmental effects of a proposed action and the range of alternatives open to him. The draft Powder River statement provides instead an incomplete and disjointed treatment of impacts and alternatives and frequently treats approval of the projects it describes as a foregone conclusion. There is much we do not know about the probable effect of these actions, and the statement leaves even more unsaid, yet it would have us rush into the projects as though there were no real risk or choice. We believe a sound decision requires more thorough consideration.

I. Inadequate Treatment of ImpactsA. Organization of the Statement

The statement's first problem is organizational. The list of content requirements in section 102(2)(C) of NEPA does not necessarily dictate the structure of impact statements. The law in effect demands answers to two questions. First, what impact will the proposal have -- what are its total effects, what measures will mitigate those effects, and what adverse consequences and irretrievable resources commitments cannot be avoided? Second, what other choices are open and what will

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their effects be? Rather than give a clear, coherent answer to the first question, the draft statement spreads partial answers over the entire statement. Thus to know what will ultimately happen to the water resources of the Eastern Powder River Basin, for example, we are forced to consult at least six different sections of the statement, sometimes hundreds of pages apart. Even if the entire treatment of this and similar impacts were sufficiently thorough, this splintering of what should be a single discussion would still create needless overlap and confusion. The statement should be revised, then, to contain a comprehensive treatment of ultimate impacts.

B. Relation to Other Projects

A more serious problem with the draft statement concerns its scope. As it now stands, the study contains specific analyses of four proposed mining operations and a proposed rail line and a "regional analysis" of the cumulative impacts of these and several related coal-using developments on a "study area" consisting of a portion of the Powder River Basin lying in Campbell and Converse Counties. The statement also says that submission of mining and reclamation plans for similar operations in the same area "can be anticipated in the near future" (Preface at 2), and goes on to note that four additional plans or letters "indicating an intent to mine coal in the near future" were received by the Geological Survey after it was decided to do specific analyses of only the original four mining proposals

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(I-5). The statement then promises that "all potential mining of which knowledge was available, or which could be reasonably inferred or projected," is included in the regional analysis section (I-5), and the added generating capacity has apparently also been taken into consideration in that section.

While regional analysis is a laudable and important goal, it is disserved by the approach the draft statement takes. Much more development of coal reserves and related industries will probably soon take place in the Converse and Campbell County areas, of private and state coal, if not federal coal. Presumably the four additional plans and letters received by USGS in the last few months do not exhaust the "similar submissions" the Preface promises. A comparison of Maps 3 and 5 in the Appendix indicates that there is a good deal more preliminary coal-related activity going on in the study area than the statement's summary of proposed activity would imply. In addition, the statement hints at additional coal-related industrial developments that are not included in its later projections: a second gasification plan, already proposed (I-41); and a second slurry and additional pipelines (I-50).^{1/} With all this activity already taking place, or about to take place, it can only hinder the goal of a regional analysis of the study area to draw the line at the first four mining projects and consider only their cumulative impacts on the

^{1/} The BLM is aware that Cameron Engineers of Denver recently identified a potential for nearly 70 coal-related industrial facilities in the Wyoming portion of the Powder River Basin. (Memorandum from State Director to Director, BLM, February 5, 1972, p. 2).

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area. And even a good faith effort to incorporate all available information from several more recent project proposals will not generate a genuine regional analysis in this situation.

Inevitably, that additional information will be incomplete and conjectural, and the projections based on it will be similarly flawed. And "inclusion" of these additional projects in a regional analysis now will create a temptation later to claim there is no need for specific impact statements on each of them. Unless some compelling administrative reason for carving off this particular chunk of coal development in Campbell and Converse Counties appears, then, regional analysis of that development's impact on the study area must wait until there is firm information on a much more substantial fraction of the entire effort. Unless this is done, decisions will be made now on the basis of projected impacts that are substantially less serious than the actual cumulative impact of the whole course of the area's development are likely to be.

The draft statement is also seriously limited along another dimension. Though the study defines the "structural" Powder River basin as a large area, bounded by mountains and covering much of northeastern Wyoming and parts of southeastern Montana, the study is confined to a relatively small area of that basin. Though this division is sensible as far as the local effects of surface mining are concerned, since most of the strippable coal in Wyoming is located in the study area, it makes much less sense for the far-reaching effects. The study does, to some extent, describe the projected effects of coal development in

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Converse and Campbell Counties on other areas of the entire basin, but it fails completely to set the impacts on the two counties in the context of development that will go on around them. Thus we are told, for example, that population increases due to the development treated in the draft statement will be quite large in Campbell and Converse Counties but relatively smaller in the surrounding counties (I-554-56, C-86). We are nowhere told what the increases in population in those surrounding counties will be due to their own coal-related development, an important set of facts since population increases underlie projections of socio-economic impacts. The same criticism applies to the statement's treatment of impact on water quality and supply and on air quality. Again, in the absence of a genuinely regional treatment, decisions will be made with substantially less than full knowledge of their aggregate impacts.

Only in the area of water supply is there some mention of the greater setting in which the Campbell-Converse development will take place, and that mention serves largely to warn that much more is going on than the draft statement would indicate. In Table 8 (I-486) and Figure 3 (I-487) we are told that annual water requirements in the study area will reach 120 thousand acre-feet by 1990, the end of the study period, while the annual requirements for the entire structural basin will reach 654 thousand acre-feet. While a relatively large fraction of annual water use in the entire basin is devoted to irrigation than in

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the study area, the structural basin figure still contains very large amounts that will be devoted to coal-related uses. Requirements for power plants, for example, will increase from eight to 19 thousand acre-feet per year in the study area between 1974 and 1990; an increase from nine to 100 thousand is predicted for the structural basin. Similarly, projected requirements for gasification plants and slurry pipelines will be three times larger in the structural basin than in the study area. Though much less actual coal mining will apparently go on in the area surrounding the study area (see I-18-30), these figures indicate that very substantial coal-related activity, with the attendant population, air, and water effects, will take place there during the study period. Since these and other effects will surely spill over into the study area, it is essential that decisions about development there be made with a full awareness of those effects, and this in turn implies a more geographically comprehensive regional analysis than the draft statement undertakes. The Interior Department's recently released draft EIS on a proposed federal coal leasing program presents some far different projections for coal development activity. It should be consulted before the statement is revised.

These temporal and geographical limitations, along with the statement's relatively short preparation period, implies an unseemly hast to have the proposed projects approved. One

explanation for this may be the appellate hearing scheduled in September in the Sierra Club's suit claiming an impact statement covering all coal development in the region is required.—/ Whether this or some more worthy purpose is at work here, we urge that the best interests of everyone involved will be served if the approving agencies treat coal development in the Powder River Basin in a more comprehensive fashion, including at least all the mining and industrial projects proposed for the study area in the next several years and a meaningful discussion of their relationship to coal development in the rest of the basin. As the State Director noted in his February 1972 memo to the Director, "some sense of order [must be brought] to the individual thrusts, scattered interests, and obvious conflicts, both between resources and between managing bodies." (p. 3). The Director recommended an "intensive effort" to complete a "multi-resource plan" for the entire area. (id.)

C. Inadequate Information

Another serious weakness in the draft statement lies in its repeated admissions that the information necessary to assess the most critical impacts of the proposed development simply is not available. In some cases the missing information is the

—/ Sierra Club v. Morton, No. 1182-73 (D.C. Cir.). In its June 17, 1973 order, the Court of Appeals urged that "substantial restraint be exercised in the granting of authority for coal development activity pending a disposition of this case on its merits." (p. 3)

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location and size of projected development projects, which reflects the statement's failure to consider much of the development going on in the basin. For example, prediction of long-term impacts on fish and wildlife of industry water use proposals is said to be impossible due in part to lack of information on the location and size of projects (I-528). More often, direct knowledge of the effects of various development activities is unknown. Thus, for example, the statement is unable to predict the impact of increased emissions from power plants and gasification facilities, particularly oxides of sulfur, on vegetation and animals in the area (I-467, 507, 655), yet the very large emissions that will occur even with controls (I-647-49) and the ability of these emissions to reach a wide area promise substantial effects.

The lack of knowledge is even more extensive for water-related impacts. The possibility of toxic levels of trace elements being concentrated in plants and thus reaching livestock and wildlife where water infiltrates aquifers through backfill deposits "needs extensive research and monitoring." (I-499) Changes in concentrations of dissolved solids in surface water and the impacts of direct discharge of sewage effluent from industrial installations cannot be assessed with available data (I-500). The total effect on regional water quality "cannot be assessed with data currently available" (I-502). Most serious, though, is the confessed lack of knowledge about the success of reclamation:

Generally, operating surface mines have not been in production for sufficient length of time to provide a full assessment of rehabilitation techniques within the region. (I-79)

The water requirements for land reclamation have not been satisfactorily determined; this activity needs extensive research and experimentation. (I-485)

With the semi-arid climate prevalent for the study area, successful revegetation on the severely disturbed mined areas is unknown at this time. (I-655).

Along with these direct admissions, the many conjectural and highly general statements the study makes about the impacts of the proposed development indicate that a great deal of what will happen to the study area in the coming years is unknown. NEPA does not require, of course, that federal agencies predict with certainty every impact of a proposed action; it is, of course, necessary at a minimum to point out deficiencies in available information. But the deficiencies in this statement are so numerous and occur in so many of the important areas of impact that they may well constitute a major inadequacy in the statement; after some point, lack of information becomes sufficiently extensive that the agencies cannot meet the basic NEPA obligation to assess environmental impacts.

D. Inadequate Discussion Of Impacts

Finally, the impacts the draft statement does discuss are in several respects inadequately treated.

1. Water

The statement's discussion of projected impacts on the water resources of the Powder River Basin is ambiguous and incomplete. In spite of the fact that the area is relatively water-scarce, the statement paints an optimistic picture of water availability during the study period. Water requirements in the study area, we are told, will grow from the present annual consumption of 70 thousand acre-feet per year to a total annual requirement in 1990 of 120 thousand acre-feet per year (I-58, 486).^{2/} The fraction of this requirement that represents existing uses is now supplied in part by surface and in part by ground water, in an unspecified proportion (I-253-55). In spite of this, and in spite of the fact that remaining available surface water is very limited (I-257), the statement assures us that the annual groundwater recharge of 150 thousand acre-feet per year is sufficient to supply the 50 thousand acre-feet per year increase due to

^{2/} This projected increase seems artificially low. More explanation and discussion would be helpful. For example, apparently only one gasification plant using only 14,000 acre-feet of water annually is projected by 1990 (p. I-58). In contrast, the Interior Department's Bureau of Mines has projected 36 gasification plants in operation nationwide by 1985. (EIS on Federal Coal Leasing Program; DES 74-53, p. I-199) The Northern Great Plains Resources Program draft report projects 16 gasification plants in the Northern Plains by 1985. Is only one of these to be in the Powder River Basin, by far the richest coal area in the region?

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mining development, and indeed the whole 120 thousand acre-feet per year requirement for all uses (I-489-90). Not only that, the statement goes on, but withdrawal in excess of annual recharge over only two square miles would supply the total requirements of the study area (I-490), and there have been numerous proposals to import water from rivers in other parts of Wyoming, which offer amounts very much in excess of the requirements of the study area (I-266-67).

There are some problems with this assessment, however. First, much of the water in the study area is not suitable for some of the purposes that make up the total water requirement (I-491), which raises the possibility that some water in the area might not be physically available for uses to which it is suited, thus decreasing the aggregate amount available.

Second, it is not clear whether the 150 thousand acre-feet per year annual recharge figure, which simply appears in the impact section with no prior mention in the treatment of existing resources, applies only to the study area or to the entire basin. And even if, as seems likely, the figure does apply only to the study area, it is not clear from the statement that all of this water is actually physically available for use in the study area.

Third, the statement is unable to specify from which mix of sources the increase in water use due to coal development will be supplied. That, the statement says, will be

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left to each company: "The quality of the various sources as well as the economic and environmental feasibility of their development must be considered by the individual companies" (I-489; see also I-490-91). Aside from abdicating the government's statutory duty under NEPA to consider "environmental feasibility," this leaves the agencies unable to assess in any meaningful way the "major impacts on the water resources of the area" (I-485) that development will have. We are given general statements that water levels around mines will be lowered (I-492), that downstream flow will decrease (I-495), and that some neighbors may have to drill wells deeper (I-495), but it is nowhere said which of these effects we can expect, where, and with what magnitude. We are left, in sum, with no real sense of what is going to be done to the water resources of the area.

Of course, since the 50 thousand acre-feet per year increment in water needs is due largely to coal-related developments -- municipal growth, power plants, slurries and gasification plants (see I-58) -- most of which the agencies admit they know little about, they cannot be expected to be very specific about impacts. But this is hardly an excuse. If they are not required to wait until they know enough about new power plants and gasification plants to assess their impacts, they must at least spell out fully the impacts that would result from alternative water-use patterns. If water is to be imported from the Green River, what impacts will

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that have? If all the remaining surface water is to be used, what impacts will that have on the uses now dependent on that water flow? The statement contains none of this.

Finally, the statement leaves at best an incomplete impression of the impact the proposed development will have on water resources because it fails to consider other water uses in the area, a point touched on earlier (pages 5-6). The statement says only that "competition for these sources will occur from energy-related developments outside the area" (I-489). Even assuming that the development the draft statement does consider is the only development that will occur in the study area, a brief look at the projected requirements of the entire Powder River Basin compared with the available local and importable water (charted in Figure 3, I-487) indicates that we should not be so sanguine about the availability of water for the study area. A fuller and clearer treatment of water availability in the entire structural basin would, we think, induce considerably more hesitancy in approving large-scale development of mine-mouth industry and water-based transportation systems in the area. It may be that the water requirements of mining itself will be relatively small, but the related developments seem to promise impacts very much more severe than the draft statement now anticipates.

In addition, largely due to the lack of information noted above (pages 10-12), the draft statement's treatment

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of impacts on water quality is wholly inadequate. It is clear from the few pages that discuss existing water quality (I-248-53) that very little is known about it. This discussion does little more than summarize a few scattered readings of dissolved solids that have been taken in the past and present a series of suspended solid readings taken largely in the early 1950's. Slightly more than two pages of the regional analysis are then devoted to discussion of impacts on water quality (I-499-501, 654). The treatment is again largely summary and highly conjectural, ending with the statement: "The overall reduction in water quality which will take place is unknown" (I-654). The comparable sections of the site specific portions of the statement simply repeat these general statements. We believe that, if this nearly complete lack of essential information does not dictate some delay until more is known about water quality in the area, it at least requires that a revised statement make some effort to predict what the relative water quality consequences of various alternative mining and reclamation methods would be and some attempt to estimate the magnitude of the various impacts, perhaps relying on experience with similar mining operations now being conducted.

2. Air

The draft statement's discussion of projected impacts on air quality suffers from similar infirmities. Because sampling has been carried out only for particulates

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and only in the recent past (I-131), the statement makes no attempt to assess existing air quality other than to state that it is "considered good" (I-468). Similarly, though the statement repeatedly says that projected emissions, even with controls, will have an adverse impact on air quality (e.g., I-461, 468, 647-48), there is virtually no attempt to specify the magnitude of that impact or where it will occur. The only attempt at such specification -- a statement that the "24-hour mean suspended particulate" reading will increase from a range of 13-60 to a range of 20-200 micrograms per cubic meter, compared with a national primary standard of 75 micrograms per cubic meter -- is flawed because there is no such standard. The national primary standards for particulates consist of an annual geometric mean and a maximum permissible 24-hour concentration as the draft statement itself notes (I-614).

Since the emissions from the developments under study here can be estimated fairly accurately (I-649), however, and since a fair amount appears to be known about atmospheric conditions in the area (I-127-31), it is legitimate to expect in a revised statement a more thorough consideration of air quality impacts. This discussion should also consider the likely impacts of emissions in the study area on the surrounding areas, including the large and important recreational areas to the west, and make at least some attempt to set these impacts in the context of those that can be expected from

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similar coal development in the greater Powder River Basin. A particularly important problem the revised statement should discuss is the long-range danger of loading the atmosphere with large quantities of sulfur oxides, which the many mine-mouth facilities planned in the Powder River area promise to do, even with controls. There should be at least some notion of the possible effects of acid rain and other effects of such loading, before large-scale development of mine-mouth facilities is set in motion.

Another serious problem is the draft statement's complete failure to address the potential conflict between the air quality impacts of the proposed mine-mouth facilities and the non-degradation provisions of the Clean Air Act. The Supreme Court recently affirmed a lower court ruling that this law permits no "significant" deterioration of existing better-than-standard air quality, Sierra Club v. Ruckelshaus, 344 F.Supp. 253 (D.D.C. 1972), aff'd by an equally divided court, 412 U.S. 541 (1973). EPA has not yet issued regulations interpreting "significant deterioration," but it appears at the very least that no large changes in the quality of the air in a region can be allowed.

What little the draft statement does say about projected impacts, however, virtually promises such large changes. "Short-term adverse effects are not expected to be significantly harmful to either humans, animals, or vegetation," we are told, "except possibly during periods of inversions" (I-648), and

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the area is subject to significant numbers of inversions (I-127-29). Since the national primary and secondary standards are set at the lowest levels at which harmful effects to human health and to vegetation and other values occur, the statement as much as tells us that air quality will deteriorate at least to the levels of the standards, surely a major change in an area where air quality is very likely to be well above standard. The statement goes on to promise a "cumulative decline in air quality" beginning in 1975, accelerating through 1990, and continuing "as long as coal was mined and consumed in the study area" (I-648). And the controlled emissions projections from only the facilities considered in this impact statement show a 55 per cent increase in sulfur dioxide emissions by 1982, a 104 per cent increase by 1985, and a 125 per cent increase by 1990 (I-649). Little technical expertise is needed to conclude that, even with the best of atmospheric conditions, these emissions increases promise a "significant" deterioration in air quality.

We have been informed that EPA will soon publish in the Federal Register revised proposed regulations governing non-degradation that are a modification of the "area classification plan" previously proposed along with three alternative plans in 38 Fed. Reg. 18986. Under the revised regulations, states would be divided into three classes, one allowing virtually no deterioration, one allowing deterioration normally associated

with moderate growth, and a third allowing deterioration up to the secondary standards. Although the revised regulations will apparently place no limits on the relative proportions of each class in any state, and the entire Powder River Basin could presumably be placed in the third class, it is not clear that even this would legitimize more than a part of the expected deterioration.

In any case, we seriously doubt whether the revised EPA regulations would meet the requirements of the Clean Air Act. EPA argued before the Supreme Court that different areas should be allowed to define significant deterioration for themselves, and the Court's holding against them implies a clear rejection of this notion. (See NRDC Comments on Proposed Rules for Prevention of Significant Air Quality Deterioration, June 20, 1973.) The EPA scheme would also allow very considerable deterioration, which runs counter to the intent of the Clean Air Act that only a relatively small amount of additional deterioration be allowed. And the Powder River Basin coal development is likely to provide a perfect example of how much deterioration the area classification scheme would allow. Even if the projected emissions lowered air quality only to the secondary standards, it is clear that massive amounts of at least sulfur dioxide will be pumped into the air above the northeastern corner of the state. (Recall that the total water requirement of power plants for the entire basin -- a rough measure of the total

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size of the plants -- is five times larger than the requirement for the study area, plants from which will alone increase SO₂ emissions 125 per cent by 1990 (see I-486, 649).)

And it is likely, moreover, that the secondary standards will not even be met, and that even the loose EPA interpretation of non-degradation would therefore prohibit at least some of the emission-producing development planned for the area. There is no clear proof of this, of course, but some indication of what will happen lies in the draft statement's projection of the "24-hour mean" particulate reading (I-468). The statement is apparently referring to the annual geometric mean primary particulate standard, which is set at 75 micrograms per cubic meter. Whatever standard is meant, however, it is clear from the statement's prediction that the reading could jump to a range of 20-200 micrograms per cubic meter (I-468) that not even the primary standard for particulates will be met. It seems plausible to expect similar results with sulfur dioxide and other pollutants.

In light of this potential conflict with a clear statutory mandate, then, we think it essential that a revised impact statement fully consider that conflict and demonstrate that the proposed facilities will not produce significant deterioration of air quality.

II. Inadequate Treatment Of Alternatives

The draft statement's treatment of alternatives to immediate approval of the proposed projects is inadequate in several respects.

A. Alternative Energy Sources

Even assuming that the Powder River coal which would be foregone by rejecting these projects must be completely replaced by energy from other sources (an assumption we examine more thoroughly below), the draft statement discusses the ability of each alternative source to supply this demand. The statement concludes, after discussing each alternative, that none of them can readily replace the coal expected to be mined from the study area (see I-707, 708, 743, 792, 816, 817, 843). Even granting this, the next logical question is whether some combination of these alternative sources can replace the Powder River Coal. The statement promises a discussion of that alternative (I-707).

This discussion, when it comes, is less than four pages long and entirely inadequate. We are told first:

"If the mining of federally owned coal from the basin is prevented, an equivalent amount of fuel must be supplied almost immediately from other sources, if the power plants now using the coal are to stay in operation. (I-854)

This statement is misleading and appears to have been included simply to induce a false sense of urgency. The impression the statement creates is that if the proposed projects are not

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approved we will have to come up quickly with energy to replace the coal that would have been mined or face plant shut-downs. In fact the statement makes no sense. The mining of all federally owned coal from the region is not at issue here; some such mining already goes on, and approval or disapproval of the additional mining proposed in the plans this draft statement considers will in no way affect this existing mining activity. Since it is only the existing mining that supplies power plants now in operation, failure to approve additional mining plans cannot possibly induce an immediate shortage at those plants. Some plants now planning on a future supply of coal may be forced to look elsewhere, but that is a different problem from shutting down plants now relying on coal from the study area.

The draft statement goes on to say that some combination of alternative energy sources could "probably" provide the energy required "in the long term" (I-854). We could expect that some discussion of that combination would follow, but instead the statement lists a series of "factors" -- statements about the nature of energy production in this country -- and then, with no analysis of these factors, simply presents a conclusion to which the factors ostensibly lead:

" . . . [I]t seems reasonable to postulate that for some time to come the best alternative to the production of the coal from the Eastern Powder River Coal Basin of Wyoming would be to produce an equivalent amount of similar coal from elsewhere

in Montana, Wyoming, or North Dakota."
(I-857)

Entirely aside from the fact that the "factors" the draft statement presents do not themselves dictate this conclusion (and would probably not do so even if they were fully discussed), the conclusion says nothing about a combination of alternative energy sources. If the conclusion is feasible, it should at least say so and indicate why the "factors" or any other information dictates such a result. Instead we are left with no consideration of the combination alternative at all. Since this is clearly an important and, as the draft statement admits, feasible alternative, there should be a very thorough treatment of it in the revised statement.

A variant of the combination alternative that is nowhere discussed in the statement would combine limited production in the study area with energy from alternative sources. This option has some virtue in that it might allow supply of coal-fired plants already built while reducing the impacts of full-scale development in the study area. Consideration of it is clearly required by NEPA.

B. Reduced Supply And Delay

Like so much of our past energy policy, the statement makes with little question the critical assumption that projected demand must be met (see, e.g., I-672, 708, 743, 854). Contracts

have been made, and therefore must without question be filled. The alternatives are "blackouts, brownouts, reduction in economic development, and inability to supply consumer demands" (I-673). The site specific sections of the statement echo this assumption, warning of a "shortage of fuel at the power plants in the area of consumption" (III-159, IV-161, V-153). "Electrical stations in the area of consumption," we are told, "would lose the supply of coal for which they were designed unless coal of like quality from another mine in the area was substituted" (III-160, IV-162, V-154).

The implication of all this is that there now exist power plants in the midwest and south that can take only coal and that must have that coal to meet demand that is certain to materialize during the course of the study period. Any failure to supply that coal, and supply it soon, will induce costly plant conversions and serious shortages.

Fortunately, the situation is considerably more flexible than that. The site specific portions of the draft statement reveal that a very substantial fraction of the coal production planned for the study area over the first ten years of the study period will go to power plants that are either not yet built or are only now being constructed. Carter Oil Company is under contract to supply 3.6 million tons of coal in 1977 to a power plant in Indiana the site for which has not yet even been selected. Production is scheduled to rise to 5 million

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tons per year through 1982, and then to 12 million tons per year thereafter (IV-4, 161). The statement says that the company will have coal left over to "supply additional purchase contracts" (IV-4), and the escalation to 12 million tons per year is only "projected" (IV-161). Kerr-McGee Corporation has contracts to supply coal to three southern utility companies that will require production to rise from 1 million tons in 1976 to 9.2 million tons in 1979 (V-3-4). The draft statement says that roughly three fifths of that total production will go to a power plant in Arkansas that is not yet constructed and for which a permit has not yet been obtained from the State Public Utilities Commission. Another fifth will go to a Louisiana plant now being built, and the remainder will go to another Louisiana plant not yet under construction (V-21-22). Roughly one third of the total Kerr-McGee production is allocated to option contracts (V-21). Table 3 (I-36) indicates that Kerr-McGee production will rise to 12.62 million tons in 1982 and then to 15.9 million tons in 1985, but the draft statement nowhere indicates how this additional production will be used. Wyodak Resources Development Corporation is currently supplying .7 million tons per year to one onsite and two offsite power plants. New production of 2.5 million tons by 1977 and 5 million tons beginning in 1982 will be used at the new mine-mouth facilities described in the draft statement. Finally, ARCO has contracted to supply 1.2 million tons of coal in 1976 to power plants in Nebraska,

Oklahoma, and Texas, with production rising steadily to 10 million tons by 1979. There is no indication in the draft statement whether these plants exist already or have yet to be built.

The upshot of all this is that roughly three quarters of the total annual coal production projected for the year 1984 will go to power plants that have yet to be built or are only now being constructed, and the fraction might be much larger. To be sure, plans for these plants have been laid and contracts to supply them made, but conversion to other fuels or some delay in construction for these plants would have impacts far less serious than would the conversion of existing facilities the draft statement implies will be necessary. Moreover, the pressing demand the statement says will be not met unless these projects are approved is only projected demand, and judging by estimated production figures in Table 3 (I-36), is relatively small compared to the level of production the area will eventually reach. Total production in 1976 is to be 2.4 million tons, and in 1977 11.127 million tons, compared to 42.9 million tons in 1984. Although demand may be rising in the areas to be supplied by these projects, it is not necessarily as large and imminent as the draft statement would have us believe.

Moreover, there is nothing to indicate that even these relatively small estimates of production for the initial years of the study period are accurate indicators of the demand the utilities will actually face. The statement nowhere

examines in any detail the utility demand projections on which the production estimates are based -- projections utilities have considerable incentive to inflate. And the possibility that various demand reduction measures might lower power needs in the next few years is not explored. The draft statement does include a very general discussion of energy conservation (I-829-42), but no attempt is made to consider what effects conservation measures would have as part of specific alternative courses of action. Thus there is nothing to show us that use of energy saving measures in the consuming areas considered in this statement could not reduce demand and thus mitigate the effects of restricted coal development in the Powder River Basin.

This assessment of the assumption that all projected demand will have to be met indicates that at least two important alternative courses of action have been inadequately treated in the statement.

1. Reduced Supply

We said above (pages 21-22) that the option of filling the entire energy need projected in the statement with some mix of alternative sources, or a mix of Powder River coal and alternative sources, had been inadequately considered. With the assumption that the entire projected demand must be met removed, this inadequacy becomes even more serious. Even if it could be shown that no mix of alternatives could possibly supply all the projected demand, it might still be that alternative

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sources could meet a more realistic demand estimate, or that they would come sufficiently close to meeting projected demand so that no serious consequences would result. Given the very severe impacts of immediate development in the study area, these possibilities warrant thorough discussion in a revised impact statement.

2. Delay

An important and related option is to delay development in the study area. In view of the current lack of knowledge about the full extent of development in the study area, the value of a genuine regional analysis of development in the entire basin, the major gaps in our knowledge of the impacts of coal development in such an area and of the measures that can mitigate these impacts, and the likelihood that new pollution control and mining technology and alternative sources of energy will soon develop, the option of delaying development demands full consideration. The draft statement does mention the virtues of delay (I-672-74), but the treatment is cursory, and the specter of brownouts, blackouts, and reduced economic development is again raised.

A revised statement should be much more thorough. It should state fully the extent of our lack of information and attempt to assess current efforts to remedy that lack and develop new methods and technology. The statement should examine more fully the accuracy of demand projections and the likelihood of serious shortages associated with various degrees of delay. And

there should be some weighing of the likely benefits in terms of mitigated impacts and greater knowledge that will result from a given delay against the possibility of shortages or alternative impacts from substituted sources of energy.

C. No Mine-Mouth Development

It is clear from the draft statement that it is the mine-mouth developments planned for the study area that will account for most of the increased water use and produce most of the air pollution in that area. And water use and air pollution are the two aspects of the projected development that will most clearly have impacts reaching beyond the scope of this study and that are least adequately treated in the draft statement. These considerations suggest that it would be well in a revised statement to consider the alternative of restricting mine-mouth development while allowing mining itself to proceed, an option treated nowhere in the draft statement. Aside from removing the sources of two major impacts and serious defects in the statement, that alternative would lessen most of the other, local impacts associated with the development, particularly the socio-economic effects.

Several variants of the option are possible. One would allow no mine-mouth development at all. Another might allow for only the Wyodak expansion necessary to meet local power needs. A third variant might allow mine-mouth development on a delayed or phased basis, to allow for development of knowledge

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about impacts and new pollution control and energy technology, and for more ordered growth in the surrounding communities. Given the significant impacts of mine-mouth industry and the likelihood that a great deal more of it will be proposed for the Powder River Basin, these and similar alternatives should be fully considered in a revised impact statement.

III. Proposed Federal Legislation

The draft statement should also discuss the recent surface mining legislation which passed the House of Representatives, and which barred surface mining on National Grasslands. ARCO's mining plan is for coal deposits more than half of which are under National Grasslands (p. I-2); Kerr McGee's mining plan is for 640 acres of National Grasslands (p. I-4). Clearly a substantial amount of development could be prohibited by this amendment, if it survives in conference and the President signs it.

CONCLUSION

This draft statement is seriously flawed for the reasons set forth above. Apart from these inadequacies, the statement illustrates a basic defect in the Interior Department's meshing of NEPA with its responsibilities for managing federal coal resources. The government has made no attempt to control the rate or end use of federal coal leased by private companies. Once the coal is leased, the government regards itself, in fact if not in law, committed to allowing its extraction and use on whatever terms the lessee wants.

Here, for example, the lessees have in some instances signed contracts for the sale of coal over the long term without any federal analysis of the environmental impacts. Now this statement, which is supposed to consider the environmental implications of, and alternatives to, approving these mining plans, uses the existence of these contracts to justify rejecting all alternatives, including rejection or delay in approval. This Catch-22 scenario makes a mockery of the NEPA process. At the least, the government should not permit production contracts to be signed before mining plans are approved, especially where no NEPA statements have been prepared on the leases.

On balance, the statement consistently presents the impression of being a justification for an action already in fact accomplished and approved. The haste in which the statement was prepared and released merely bolsters this impression. We feel sure that no serious consideration was, or will be, given to delay approval of, or rejecting, the mining and railroad approvals here under scrutiny. We hope an objective evaluation will be made in a new EIS and that, in the face of the tremendous uncertainties and conceded adverse environmental impacts, approvals of these operations will be withheld at least for the time being. A delay in a final decision in some or all of these proposals is particularly appropriate given the current uncertainty about a federal coal leasing program, and

the status of federally sponsored coal development generally. In particular, the new EIS here should contain a detailed consideration of the federal coal leasing program EIS now out in draft form.

July 31, 1974

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Mr. Baker,

This letter contains my comments on the draft environmental statement for Eastern Powder River Basin coal development.

When I requested a copy of the statement from your office--I wish to thank you for providing it free of charge--I hoped to review and comment upon it thoroughly. As it turns out, I will be able to provide you with only very limited comments if I am to get them to you by or at the deadline. I will have to ignore entirely the specific proposals presented in the statement--Volumes 3 and 4; my general view of the wisdom of those proposals will be made clear, however. My comments will focus on Part I of the statement--Volumes 1 and 2--though here also they will deal with only certain selected sections of that part. I apologize for this incompleteness, but I want to make it clear, because my silence on major parts of the statement does not indicate agreement.

One of the major reasons advanced for development of this coal is its low sulfur content, as opposed to eastern coals. The statement of course notes this and presents tabular evidence to support it. I have read recently in High Country News an article which stimulates some doubts about the low sulfur argument, and I think the statement should discuss the factors mentioned in the article.

The article quotes a House Interior and Insular Affairs Committee study: "The issue of whether western coal is preferable to eastern coal, due to its low sulfur content, is confused by the use of data based on the sulfur content of coal on a tonnage, rather than on a BTU, basis. When one considers that substantially more western coal will have to be mined, shipped, and burned to produce the same amount of heat value as a smaller amount of eastern coal, the tonnage figures become meaningless...Western coal contains up to ten times more moisture than eastern coal. It must be dried before burning. In the process of drying, the per-ton sulfur content of western coal ~~at~~ is appreciably raised. Thus, if one compares the sulfur content of western coal at the mine mouth with that of eastern coal, the lower sulfur content of western coal is more apparent than real. Western coal, as burned, has a sulfur content approximately equal to that of eastern coal, but with a lower BTU content. Thus, there are equal or greater sulfur oxide emissions from western coal on a per BTU basis."

The article also paraphrases the study that "because the effective sulfur level of western coal reserves is much higher than what has heretofore been considered, the actual recoverable tonnage of low-sulfur coal is about one-fourth of what we have been told."

The statement does not deal with the issues raised by these quotes--not in the text, and, as far as I can tell, not in the tables. In view of the widespread publicity which the coal companies and utilities have given to "Western low-sulfur coal", I think the statement should address this confusion; it has at any rate confused me.

The related matter of sulfur control technology is mentioned briefly in the statement on pages I-33 and I-803-4; I think the status of this technology should be addressed more thoroughly. Two general statements from a 1970 review are quoted; surely there is more up-to-date and specific information. The state of this technology will have a direct impact upon the utilization of western coal; the probabilities and expectations for this technology in the near future are of value to a public seeking to reach judgments.

The sections of the statement that deal with impacts upon people and their communities raise many more questions than they answer, and some, I think, could be answered.

Much of the data used in these sections is 1970 data; this is particularly true in the discussion of housing. The present tense is used in connection with this data, but, just as it will be a long time, for Gillette and Douglas, from 1975 to 1980, it has been a long time from 1970 to the present. Present data, however skimpy, should be used; if not available, it should be developed. On a matter of this importance, I think it is best to take the time to secure an up-to-date picture.

How have the mobile home and crowding statistics changed since 1970? How has the home loan and mortgage picture changed? How has the housing cost picture changed? How do the more recent figures strengthen, weaken, or augment projected impacts?

What are the cities and counties doing now to meet the housing demand? What is being built with what kind of financing in what price range? Are government housing programs being taken advantage of? Are the federal and state governments and the incoming industries helping, in any organized or unorganized way, to meet housing need?

Similar questions suggest themselves for education: At what stage of precision and readiness are individual school district plans to deal with the coming deluge? What are these plans? Are there any organized or unorganized supplements to existing funding sources and levels? What are teacher turnover levels?

Throughout the socio-economic impacts sections, the most important area is most ignored--money. How are communities planning to finance their future obligations? How much will each area of required expansion cost? How much tax revenue will the localities derive from incoming industry? How much help can they expect from federal and state sources? What is the present state of city, county, and school district finances? What is the present tax load? What are the tax ramifications of mobile homes and permanent residences? What are the tax ramifications of present settlement patterns? In short, a detailed coverage of the present financial situation, a projection of future financial resources and trends, and a study of the differing financial alternatives. Time should be taken to develop this information if it is not available.

The sections on wildlife impacts are of particular interest to me; again, many questions are raised and many information gaps revealed, and time should be taken now to answer and fill them.

On page 320, the statement puts the situation well:

"To analyze the impacts on wildlife from coal development in the basin, the ecology of each species involved must be known. Information with respect to food, breeding habits, migration routes, seasonal and key habitats, life cycles, predators, population trends, carrying capacities of given habitats, etc., is limited in scope...an understanding of how individual species relate to others in local ecosystems is necessary."

To know the ecology of each species in the basin is an ideal; but I think it must be approached much more closely than it is in this statement. This should be done before development proceeds, or rather, continues. My specific questions and comments deal unsystematically with only a few of the gaps.

On page L-526, the statement estimates that 500 to 1,000 miles of fencing will be put up in the basin by 1990. Will any of this fencing interfere with established migration routes, and to what degree?

Page L-528 mentions the impact to wildlife of water transfer from agricultural to industrial use. Since many specific requests for such transfers have already been made, it should be possible to study these requests and the land they affect to determine the general range and type of impacts that can be expected. An intensive study of a few "typical" requests could provide detail with both inherent and extrapolatory value.

On page L-529, regarding threatened species, the statement says, "Inventories as to the exact occurrence and dependency of these species on the area to be developed and/or disturbed have not been accomplished. Therefore, precise impacts cannot be analyzed at this time." Therefore, precise measures cannot be taken to avoid impacts that might be avoidable. These inventories should be done before development continues. All the statement really says is that threatened species could be affected adversely; I don't believe that is exactly fulfilling the intent of NEPA. Prairie dog towns should be mapped and studied. Likely and confirmed habitat for all endangered species should be inventoried.

Aquifers in which it is contemplated or proposed to sink wells should be analyzed in terms of off-site importance to wildlife, and the proximate range of impacts from such wells discussed.

Areas frequented by wintering eagles should be inventoried.

Where and from which streambeds is sand and gravel removal for construction pur-

poses likely? How do amounts of sand and gravel correlate with strambed area to be disturbed? What are the wildlife values of these areas?

The extent and status of private and state coal holdings and leases should be appraised in the statement, and the impacts presented in conjunction with the federal impacts. These two areas of impact can be separated only on paper. Private and state coal development has obvious bearing on federal policy and federal land. Page C-50 of the appendix indicates that impacts to wildlife from private and state development could be somewhat more than noticeable; other areas of impact would be similarly affected. It doesn't make analytic or planning sense to ignore these impacts as well.

I think it would be helpful to put in one place in the statement all references to present research, whether being conducted within the study area or being off-site study relevant to study area concerns. This would include federal, state, and private research, and would indicate the direction, progress, findings, and expenditure. The reader would be able to determine more clearly and precisely if and to what extent information gaps are being filled. This would also make clear gaps in research itself; it would also indicate to the reader in some measure the time involved in dealing with problems or developing data.

One major impact that is ignored in the statement is the impact upon Appalachia from this projected massive shift to western coals. This may strictly speaking be beyond the scope of this statement, although development of Powder River Basin coal at the rate projected will directly affect Appalachian coal mines. The people of Appalachia at any rate deserve more consideration than they have (ever) been given; this statement could at least raise the matter.

I don't believe this statement adequately assesses the impacts which the projected development of Eastern Powder River Basin coal is likely to have; I think an adequate assessment would make a positive contribution to planning, and this statement doesn't do that. Nor does it inform the public to the extent I think is required. The public today is exceedingly uninformed about this development, and while philosophically it may be the public's own fault, practically the government has done little to dispel the ignorance and draw the public into participation in decisions.

I have attempted to dispel my own ignorance concerning western coal development with only moderate success. Government information sources, like this statement, confound efforts to get a total view, both for legitimate reasons of scope and practical, and avoidable, reasons of lack of time, lack of money, lack of study, and lack of direction. I believe this to be a matter of such importance that I cannot really believe events are proceeding with so little direction, planning, and study--with so little apparent interest from those who run the government. I fault not so much those who compiled this statement as those who set the boundaries of the job in time, money, and manpower. I think those who set the boundaries are largely interested in getting out some paper quickly, to comply with a troublesome law, so as not to mess up coal company and utility timetables.

I think it is absolutely necessary to mess up those timetables. This statement, inadequate as it is, reveals the massive scope of disturbance to people, land, wildlife, etc., that will result if present timetables are held to. If effective publicity, planning, study, and monitoring is to be done, time must be spent. Only then can mitigation genuinely and effectively be applied. It is absurd to allow death, pain, and deterioration to occur when it can be prevented.

I think that further development on federal coal leases should be delayed for at least a year; this includes the specific proposals discussed in this statement. During that time, federal, state, and local study and planning efforts could at least get a loose grip on the pace and consequences of events. A major federal effort, with visibility, manpower, money, and initiative, could develop systematically as much information as possible, and present it to the public, particularly the local public attempting to cope.

Given such an effort, an environmental statement on Eastern Powder River coal development could be prepared that would make a positive contribution to planning. Various alternatives, with different values for things like development pace, locations, intensity, and kind, could be examined in terms of the full facts available for each area of impact. An example would be a model relating different rates and locations of production to wildlife; it could then be seen what it might cost in other values to steer clear of prairie dog towns or preserve a small elk herd. Other areas of impact would be similarly treated, and the results related. Research needs could be systematically identified and undertaken. All this information could be related in a broader scale to Northern Plains, western, and national coal and energy development.

This approach would essentially lead to a combination of three alternatives presented on pages I-672 to I-677. Development would be delayed pending new technology and fuller facts, where it was deemed advisable. Development when it occurred would occur in phase and staged with community development. Communities would have time to understand and prepare; a framework would be created in which institutions could seek, and offer, help. Development locations within the basin would be controlled in accordance with public decisions regarding other values.

An energy conservation program of the kind outlined on pages I-830 to I-842 could be coupled with a development program. I believe a more radical and basic program than the Office of Emergency Planning's proposal is desirable and possible, but implementation of their recommendations would certainly be wise, whether as a beginning or an end.

The statement points out that this course of action would require changes in law, which it deems "speculative". That should not prevent BLM and other federal agencies and departments from advocating such changes if felt advisable. I think the land management agencies should be advocating these changes, as well as seeking to implement the proposals presented on pages I-642 to 644. I don't think the present method of development, which relies on corporate initiative based on economic factors, is the best method. It ignores or slights factors I think are more important than economics.

But even without the major changes which full implementation of this kind of scheme would require, a great deal more in the way of planning and decision-making could be done to give this coal development a comprehensive a rational basis, if the agencies were inclined to press that way. I hope the involved federal agencies will seek both the minor and major changes that would be required.

The title of Chapter 9, Part I, expresses the framework for my view of the development scheme outlined in this statement: I think it represents short-term use of one resource for a short-term gain of money for a few and juice for a wasteful many, at the expense of the long-term productivity of the land, living components, and human society of the Eastern Powder River Basin.

Thank you for this opportunity to comment, I apologize for being late, and I would like to receive a copy of the final statement when it is complete.

*Pat Ford
800 Saturn Ave.
Idaho Falls, Idaho
83401*


GULF STATES UTILITIES COMPANY

POST OFFICE BOX 2951

BEAUMONT, TEXAS 77704

PHONE: 713-838-6631

NORMAN R. LEE
President

July 30, 1974

State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Gentlemen:

**GULF STATES UTILITIES COMPANY'S STATEMENT
ON DEVELOPMENT OF COAL RESOURCES IN
THE EASTERN POWDER RIVER BASIN OF WYOMING**

Gulf States Utilities Company and its 400,000 customers have a vital interest in the outcome of your current environmental studies. We have purchased approximately 50 million tons of coal from Kerr-McGee Corporation's Jacobs Ranch Mine located in the Powder River Basin south of Gillette, Wyoming. We anticipate that the first deliveries of this coal will begin in 1977 and that deliveries will continue for twenty years. For this reason it is important that your findings record that a significant portion of the electric requirements of present and future customers depend upon the development of this mine.

Gulf States Utilities Company provides electric power for a 28,000 square mile area in southeastern Texas and south central Louisiana. The population in this geographic area will increase due to a mild year-round climate, labor market, accessibility to water transportation, available tracts of land and an abundance of natural resources.

Additional electrical energy will be required because of the increase in population and standard of living. Because of increasing difficulties in securing oil and gas, we must supply some of these additional energy needs with other fossil fuels and uranium.

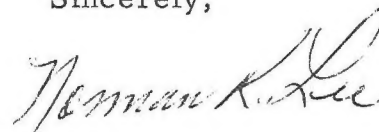
The earliest that nuclear power plant generation can be serving the Gulf States Utilities area is 1980. Coal is believed to be the most available domestic alternative to gas or oil to supply these additional fossil fuel needs. Wyoming coal was selected because it

is present in large quantities, and we believe that it can be mined, transported, and utilized in an environmentally acceptable manner with minimum environmental impact in Wyoming and in our service area.

In order to meet the anticipated energy requirements in the Gulf States Utilities service area, it will be necessary to install some coal burning generation in 1977 and 1978. One 540 MW coal burning unit will be added in 1977, and one 540 MW coal burning unit will be added in 1978. With the planned coal burning generation in service, it will be necessary to supply approximately 6,000 tons of coal per day to these units. The availability of coal for these units will greatly enhance Gulf States Utilities' ability to meet the requirements of our customers and to contribute to the nations power grid with which we are interconnected.

If we have a curtailment of oil and gas which results in not being able to supply our existing oil and gas units, it will be necessary to construct additional coal burning facilities to replace those that are incapacitated by the shortage of oil and gas.

Sincerely,



Leonard V. Lombardi
VICE PRESIDENT

Gulf Building
1780 So. Bellaire St.
Denver, Colo. 80222

August 2, 1974

State Director
Bureau of Land Management
Wyoming State Office
2120 Capitol Avenue
P. O. Box 1828
Cheyenne, Wyoming 82001

Re: Comments on the Draft Environmental Impact Statement, Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming

Dear Sirs:

Having reviewed all five volumes of the draft Environmental Impact Statement for the development of coal resources in the Eastern Powder River Coal Basin of Wyoming, we would like to make the following comments:

Overall, we think that the Department of the Interior should be commended for their effort in undertaking such an enormous task by pooling together inter-agency teams from such diverse backgrounds as BLM, USGS, USDA, USFS, ICC, etc., and completing the volumes in about three months. We would, however, like to point out several aspects which we think antagonists from the public and the press might seize on to raise doubts about the document, perhaps resulting in irrational arguments and counter-arguments and obscuring the positive aspects of the document.

1. Incompleteness and/or Inconsistency: A specific lease is frequently discussed in terms of its probable impact, with no concurrent mention of mitigating circumstances. The opinion left with the reader is that no control measures will be undertaken by the industry developing the resource and putting it to beneficial use.

For example, in discussing probable impact of the Wyodak mine property (Vol. IV, Chapter VI, Page 62-63), it is mentioned that coal dust from crushers, trucks, and coal piles and loading operations will pollute the air during windy periods; and with construction of a new 330-megawatt power plant, the projected yearly



emissions without pollution controls will be 84,000 tons of particulates, 14,250 tons of sulfur dioxide and 13,500 tons of nitrogen oxides. However, elsewhere in the same volume and chapter on Page 15, it was mentioned that for the same property with the proposed 330-MW plant, the air pollution control equipment including electrostatic precipitators with provisions for wet scrubbers for sulfur removal, has been designed and tested to comply fully with Wyoming and federal air quality standards. Surely uncontrolled emissions are of no practical significance if in fact they will be mitigated by controls. Similarly, dust suppression equipment and water sprays are currently available to control the dust to which reference was made. Finally, the general public has no way of putting 84,000 annual tons of particulate emissions in a pertinent framework. It would be helpful to compare this figure to the estimated amount of particulates picked up into the atmosphere by wind in this area during a year.

This single example is not an isolated instance but is duplicated in discussions of probable impact in several instances in the document.

2. Inconsistency: In Volume I, Chapter I, Page 78, it was mentioned that no underground development activities are proposed for coal, uranium, sand and gravel, bentonite or clinker deposits in the Eastern Powder River Basin area; on Page 192 of the same volume and chapter, it states " . . . upon completion of open pit mining, Exxon Corp. will remove uranium ore by underground methods . . . The Kerr McGee Corp. is sinking a shaft in Sec. 36 - T36N, R74W . . . The underground mine is scheduled for production in 1975."

Though this error in itself is of minor consequence, it detracts from the credence of the document as do other similar contradictions.

3. Unqualified Subjective Statements: Any document that is to be used as a basis for public scrutiny of proposed industrial development should ideally be objective in every phase of investigation; if subjective statements are necessary, they should be clearly identified as such.

The draft EIS asserts without investigative evidence many probable impacts on the environment. In several instances, direct experimental evidence exists to refute these statements. Any prediction of future impact without perfect knowledge is highly subjective.

(a) Volume I, Chapter I, Page 59:

(1) "Level of mining technology will not change significantly through 1990."

(2) "There will be a 50% loss in productivity for grazing purposes. These will occur even if the entire area is revegetated."

(Are these realistic guidelines? No improvement in technology in 15 years is a dismal thought indeed. As to productivity, the Wyoming Experimental Station Bulletin #2 of March, 1957, documented an increase of 139% to 146% in grazing productivity achieved on revegetated land near Gillette, Wyoming.)

(b) Volume IV, Chapter IV, Page 112:

In discussing aesthetics, " . . . smoothing of spoil piles and reclamation with grasses will create a smoother and softer texture; otherwise the change in texture will result in less variety and natural configuration in the landscape. It will create monotonous scenery, at least on the area that is mined. Development of the access corridor which included rail and transmission lines will . . . cut across existing natural lines such as pipelines and cultivated areas." (A mountain climber's monotony may be a hunter's joy. Natural pipelines?)

(c) Volume IV, Chapter VI, Page 88:

In talking about loss of recreation due to coal strip mining: "Mining five to ten miles from Gillette, Wyoming, will impose an inconvenience for many who must hunt close to the city." (Isn't this reaching a bit?)

(d) Volume IV, Chapter VI, Page 90:

" . . . Fences will be destroyed by mining activity, allowing livestock to drift onto and destroy growing crops." (Why assume that fences are not going to be rebuilt after mining and reclamation, and the crops are not going to be protected during mining?)

Finally, we feel that all future industrial development in the Eastern Powder River Basin should be based on accurate data relating to specific area development, its adverse/beneficial effects on the people from all walks of life on the myriad interests and usages involved and on the environment.

State Director, Bureau of Land Management
Wyoming
August 2, 1974
Page Four

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With regard to regional planning, it is obvious that considering the population sizes of communities surrounding the Eastern Powder River Basin, coal development would have a significant influence on both the social and economic characteristics of the region. However, we do not feel that company towns are desirable solutions. Properly done, coordinated regional, county and city planning will take full advantage of the desirable social and economic effects caused by this development and minimize the undesirable effects. We feel that such planning should include industry participation and input, but should basically be a tool to help local residents - new and old - keep community development on a tract acceptable to the majority.

The benefits and/or objectives of this planning could be:

- determination and coordination of land use zoning.
- balanced plans relating increased tax flows to the need for school and public services.
- development of stable, well-rounded economy, and
- assistance in providing for orderly, healthy community growth.

Our last comment is on EMARS, which is discussed as a long range planning system to be utilized by BLM to ascertain which federal lands should be offered for competitive leasing at a certain period in time. We wish to commend the BLM for approaching this management decision problem, which in the past has not been considered at high levels of Interior, and coming up with a proposed solution. Although one can recognize that there is a voluminous mass of public, private and governmental red tape to cut through in making any decision, EMARS, as currently proposed, seems to increase both time and clearances unnecessarily. It fails to respect competition in the private sector for a person not in coal production on Federal lands but who wishes to enter for the first time.

We question whether Interior can accurately anticipate market demands for coal and recommend that the proposed allocation system be modified to reflect input from a free market. We hope the U.S. Geological Survey will be given a greater role in tract selection and that industry nomination be equally considered. We do encourage revision of the current lease form to control speculation.

State Director, Bureau of Land Management
Wyoming
August 2, 1974
Page Five

Thank you for the opportunity to comment on the subject Draft EIS and we would like to request that these comments be included in the official hearing record.

Sincerely,



L. V. Lombardi
Vice President
Gulf Energy and Minerals Co.
A Division of Gulf Oil Corporation



Founded in 1892

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Upper Snake River Group Sierra Club

Secretary - Box 401
Jackson, Wyoming 83001

July 24, 1974

Bureau of Land Management
Cheyenne, Wyoming 82001

Gentlemen:

The Upper Snake River Group of the Sierra Club in Wyoming would like to enter this statement on the Eastern Powder River Coal Basin draft Environmental Impact Statement. We ask that this statement be included in the final impact Statement.

We realize that considerable time and effort went into the preparation of this impact statement, but feel that the haste involved in its arrangement and the short amount of time given for public review of the vast material contained in it defeat its purpose.

We feel in particular that the data offered on Socio-Economic impacts was wholly inadequate. Those facts that are presented in the statement are frightening and should be enough to make anyone stop and question the wisdom of developing a limited and finite resource, with many other values than energy, for the lowered standards of social services, increased crime and vandalism, and the overall lowering of community standards. (p. I. 666-668)

Of particular impact on Wyoming will be the detrimental effects on the agricultural industry. Apart from the fact of increased vandalism and molestation of livestock, due to population increases, the significance of loss of watering facilities, existing ground and surface water supplies, grazing lands, and irrigated croplands cannot go unappraised. (p.I. 662)

Water is vitally important in this semi-arid region. Its abundance or scarcity have a direct interrelationship to wildlife populations, domestic animal herds, and cultivated areas as well as its crucial applications for human consumption.

The average person can draw no meaningful conclusions from the data contained in the statement pertaining to water resource impacts except perhaps, that not even the agencies who contributed the information can agree.

We feel that there is insufficient water now, and its availability will not increase through natural means. Transbasin diversion of water will impact other areas of the state severely and will probably also impact other states as well. The impacts on ground and surface water supplies through disruption of large areas of the existing aquifers from the actual mining operations is something which cannot be overlooked. One point that is brought out in the statement is the fact that aquifer disturbance may take years to be noticed. We feel that now is the time to study the problem before a crises arises. (p. I. 485-501)

Air quality data offered in the statement is confusing and in some cases are misleading. Through mixing of tables and interpolating figures pollution rates are arrived at that at first glance are seemingly innocuous, but closer inspection show the figures to be decieving. One such instance is calculating emissions for a nintreen county area and then adding the new pollution sources from Converse and Campbell counties. The result is a small pollution increase over a large area but fails to give a true percentage increase in pollution levels in the Powder River Basin study area.

There is little discussion of the effects of downwind pollution and this is certainly very important. The statement does say that localized damage to vegetation and animals could occur from emissions to the Black Hills, the northeast portion of the Thunder Basin Grassland, and in the Rochelle Hills. (p. I. 467)

Coal is the theme and substance of this dEIS, and logically then the statement should analyze it as a basic mineral resource through all the related mining, transporting, and usage stages of it.

Coal core samples and overburden analyses are not interpreted for the general public in terms of impact on vegetation, animal, and human life. There are no statements of the upper limits of human tolerance to these trace elements. (Arsenic, Flourine, Mercury, Selenium, Uranium, Zinc, Boron, Molybdenum, Strontium, Titanium, Cadmium, and Vanadium)

Such a statement as " The concentrations appear to be normal for values as compared to other western coals." (p.IV.59) are misleading for the layman and would be meaningless for the professional When refering to trace element contents.

How is one to understand the significance of these elements when they are burned and when they are leached into surface and ground water supplies when the overburden is disturbed to reach the coal beds?

The method of measurement of available coal reserves used in this statement is also misleading. The common method of citing available reserves in tonnage figures only does not give the whole picture. According to this method of measurement, the west has about half the easily available strippable reserves of low sulfur coal.

A better method is to use an index based on BTU content. The National Science Foundation released a paper in November of 1973 which describes current coal reserves by this method. (NSF Grant GI-35821) The results of this paper show a much different perspective and should have been included in the Powder River coal statement.

It is demonstated that if coals are measured by this method the recoverable low-sulfur coal reserves of the west are reduced. Since western coal is of low heat value more must be burned to produce a given amount of energy. Because more coal is burned more sulfur oxides are produced. Sulfur oxide pollution control regulations prohibit the emission of more than 1.2 pounds of SO_x per million BTUs of energy produced. To meet this standard, coals of lower heat output must have lower sulfur contents, accordingly coal now classed as low-sulfur is moved into the medium-sulfur class. This means that only 15 percent of available reserves are in the low-sulfur class and coal to meet the national standards will soon be in short supply. (NSF Grant GI-35821 p.2)

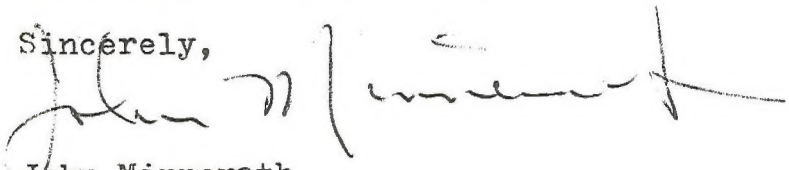
Notwithstanding the above comments we also feel that there will be adverse impacts on the aesthetical values of the study area, the historical values, and the closely related recreational values.

In conclusion we feel that because of inadequacies and inconsistencies in the statement it is of no real value as a tool to assess the impacts on the area in question and on the state. We would suggest that the statement be rewritten to include newer and more useful data that is available to the agencies involved and that it be rewritten in a form more useful for public appraisal.

The ramifications of development of this magnitude on the state of Wyoming are so great that we must very carefully assess all impacts in the study area and beyond. As pointed out in the opening paragraphs are we ready to sacrifice so much for the short-term gains to be accomplished?

We of the Upper Snake River Group of the Sierra Club in Wyoming feel that the degradation of environmental values and human life styles inherent in these proposed developments are too high a price to pay.

Sincerely,



John Minnerath
Vice-chairman
Upper Snake River Group
Wyoming Sierra Club



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UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

711 CENTRAL AVENUE
BILLINGS, MONTANA 59102

IN REPLY REFER TO:
ES/1100:142

August 5, 1974

MEMORANDUM

To: State Director, Bureau of Land Management, P.O.
Box 1828, Cheyenne, Wyoming 82001

From: Area Manager

Subject: Development of Coal Resources in the Eastern Powder
River Coal Basin of Wyoming, May 31, 1974

We have reviewed those sections treating fish and wildlife and associated recreation resources in the above five volume draft environmental impact statement.

In our opinion the draft statement adequately treats fish and wildlife resources. Quantitative analyses of impacts on terrestrial game species appear particularly commendable.


Burton W. Rounds

PEABODY COAL COMPANY

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

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301 NORTH MEMORIAL DRIVE • ST. LOUIS, MISSOURI 63102

August 5, 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P.O. Box 1828
Cheyenne, Wyoming 82001

RE: Comments on Eastern Powder River Coal Basin Draft EIS
(the Statement)

Dear Mr. Baker:

The following comments are respectfully submitted for consideration in the preparation of the final environmental impact statement. They are directed towards Peabody Coal Company's mine which will supply coal to Panhandle Eastern's proposed coal gasification plant.

1. Peabody Coal Company will use the most advanced techniques for conservation of the environment. The Company's environmental policy includes (1) being thoroughly knowledgeable of environmental laws and regulations to assure compliance; (2) cooperating closely with federal, state and local agencies which regulate its operations; (3) maintaining a sensitive appreciation for public concern; (4) making a thorough analysis of the pre-mining environment so that it may be protected during mining; and (5) monitoring key aspects of the environment during mining in order to be aware of impacts which may be mitigated.
2. Peabody Coal Company is dedicated to reclaiming the land it mines, utilizing the latest technology available, thus returning it to productive use, while at the same time protecting our physical environment.
 - a. We fully agree with the Statement that land use reclamation objectives must be "realistically attainable". The proposed Wyoming Land Quality Rules and Regulations, however, require restoration if subirrigated land after mining. Such land cannot be restored but can be reclaimed to other productive uses. We recommend that the final Statement support this position.
 - b. The Reclamation Program at Rochelle was developed using information gathered from other areas of similar climatic

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conditions. Enclosed is a copy of Prof. Berg's (LSU, Fort Collins, Colo.) paper "Composition and Production of Seedings on Strip Mine Spoils in Northwestern Colorado", along with baseline data gathered from proposed mine site area. He reports an increase rather than decrease of reclaimed land productivity under similar climatic conditions. We recommend incorporating his paper in the record of hearings on the Statement.

- c. Analysis of soil and overburden has shown with proper overburden mixing, grading, and topsoil replacement, any adverse effects associated with vegetation loss will be of a minor degree when considered over a period of a few years.
 - d. Rainfall and moisture retention will be the two most limiting factors in any revegetation plan. If suitable water is available, irrigation will be used to aid in establishment of a permanent, diverse vegetative cover.
 - e. Considerable unsubstantiated assumptions are made under "Analysis Guidelines" pertaining to reclamation. In addition, they conflict with the Wyoming Environmental Quality Act, and should be revised to conform to this Act.
3. Since water is a valuable and limited resource in Wyoming and is anticipated to remain so for the foreseeable future, water supply facilities were designed with water conservation in mind.
- a. Rochelle Coal Company and the proposed Gasification Plant will use approximately 9,100 acre feet of the expected 49,600 acre feet per year use of water in the study area by 1990.

Independent study of Peabody shows expected water usage of 81,900 acre feet of water each year after 1985. Of this amount, less than 8 percent will be required for proposed project. This contradicts findings presented in the Statement.

- b. Water requirements for the Rochelle project will be met by diversion of flood water in the North Platte River and deep wells. The actual amount withdrawn from these wells will be determined by that amount required to make up the difference between what is available from North Platte River diversion and the requirements of the plant.
- c. Any disruption of aquifers will cause some minor effects on shallow wells near the mine drawing from the same aquifer. This effect is limited to a range of one to two miles. Effect on groundwater quality from the mining operation is expected to be minimal.

With an expected 150,000 acre feet recharge to aquifers in

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the Powder River Basin (per Energy Transportation Systems, Inc., San Francisco, California) there should be a negligible effect on groundwater level from the projected 81,900 acre feet of use.

- e. The economic benefit from temporary conversion of agricultural land to industrial use will increase income of the area. Agriculture will not be significantly reduced at any particular time. Land use is primarily for grazing with very little irrigation employed. This is due, in part, to the low quality of water in those aquifers which could be economically tapped for irrigation water. The better quality, deeper water cannot at present be economically used for irrigation.
 - f. Movement of trace elements associated with overburden disturbance and ash burial into groundwater sources will be controlled by proper ash burial and effective control of surface runoff. In addition, large quantities of water would be required to effect leaching of trace elements found in buried ash. The 14 to 16 inches of annual precipitation appear inadequate to produce leaching. Further, the impermeable layer found below the coal will aid in preventing movement of any leachate into groundwater below coal.
3. Air Quality and Fugitive Dust. Fugitive dust from mining would not contribute significantly to suspended particulate matter during any inversion that may occur because the large particle size of fugitive dust causes it to settle within several yards of injection point. As mentioned, there is possibility of fifteen 2-day inversions and four 5-day inversions.
4. Socio-economic impacts associated with a large population expansion in sparsely populated areas are currently being studied. This study, "Urban Facilities Feasibility Study, Powder River Basin, Wyoming", being sponsored by Peabody, Panhandle Eastern and other companies in cooperation with the Governor's Office will recommend a concrete plan for adapting the increased population to the area. The results of the study should receive the widest publicity appropriate to permit public input to eventual action taken to reflect absorption of the increased population to the Powder River Basin community.

Respectfully submitted,

Jack Beckner

Jack L. Beckner
Environmental Manager
Impact Reports



United States Department of the Interior

BUREAU OF OUTDOOR RECREATION
WASHINGTON, D.C. 20240

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IN REPLY REFER TO:

DES-74/65

AUG 6 1974

Memorandum

To: State Director, Bureau of Land Management, Cheyenne, Wyoming

From: Director, Bureau of Outdoor Recreation

Subject: Review of draft environmental statement on development of coal resources in the Eastern Powder River Coal Basin, Wyoming

In response to your request for this Bureau's comments on the subject draft statement, we are submitting the following:

General Comments

While the statement does address itself to the recreation resources in the area and the probable impacts of the proposed action thereon, we feel that the discussion is deficient in that it does not present adequate detailed and quantified data upon which a reasoned judgment as to the impacts of the project upon outdoor recreation could be based. We also believe that insufficient consideration is given to the possible cumulative or long-term effects of the action. In our opinion this is required to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations," as indicated in Section (101(b)(1), P. L. 91-190.

Specific Comments

Regional Analysis (Volumes I & II)

Recreation Resources, Volume I, page I-347--In describing existing hunting and fishing opportunities, quantitative information on current use by residents vs. nonresidents is necessary to determine the value, economic and otherwise, of visits by out-of-State hunters and fishermen. Other recreation resources should be similarly treated.

Any unique hunting and fishing resources should be identified and quantitatively related to the total availability of such resources. The statement identifies the Powder River Basin antelope harvest as approximately 50 percent of the total State harvest. (p. I-347, par. 3.) Further quantification is needed to relate the area harvest to the total

harvest in North America since antelope hunting is a recreation resource unique to limited areas of the continent.

Waterbased recreation, skiing and snowmobiling are mentioned and illustrated in this section, but no quantification is included and thus it is not possible to judge the importance of these resources. We suggest that the final statement should include factual information concerning acreage, visitation, and projected supply and demand for these activities.

In discussing the recreation resources of the project area, we believe the statement should address the resources and opportunities available in the urban areas. Although we recognize the importance of hunting and fishing in Wyoming, the predicted influx of people to the urban areas by the 1980's and the simultaneous decrease (in acres) of available recreational land, make it increasingly important to provide a higher quality and larger quantity of recreational experiences within the cities and towns.

Included in the discussion of urban recreation should be an assessment of present use and predicted use levels as a result of the increasing population. Table 33 would become more meaningful if it included data on the recreation days of use at each of the listed facilities, and the present capacity of same. From population projections and the resource inventory, some sort of demand analysis should be devised whereby one could estimate future demand (1985, 1990, etc.) for certain types of activities in each particular area. Amount of land (acres) and types of facilities which will probably be in greatest demand could be estimated, along with their dollar cost, from the projected demand figures.

The statement should include reference to the historic Oregon and Mormon Trails currently being studied by Federal, State and local participants as potential additions to the National System of Scenic Trails. Impacts on the trails, both primary and secondary, occurring due to the coal development projects, need to be assessed, and measures to minimize harm to these sensitive areas should be described.

Probable Cumulative Regional Impacts, page I-537 Volume II.

The water base will be substantially affected due to large changes in use which would occur. Where possible, the losses to recreation in terms of degraded water quality and acre feet available, and the resulting effect upon visitor days should be quantified. The impact of removing water-based recreation from an area with a shortage of water will be severe. The possibilities for alternate and supplementary sources of water supply need to be addressed in the statement.

In general, the relationship between increased demand and reduced supply of recreation resources needs to be stated and quantified as an impact of

the proposed action. Such quantified impacts should be developed for each recreation opportunity currently existing in the study area.

Impacts resulting from the gradual slowdown and eventual termination of the proposed action need to be considered more fully in the final statement. This is necessary in order to determine whether the short-term uses proposed are consistent with the long-term productivity of any recreation resources affected by the proposed action. It is also crucial in determining whether measures taken to mitigate the increased demand for recreation will be short-term or long-term commitments of recreation resources.

Analysis of Proposed Mining and Reclamation by Atlantic Richfield Company, Carter Oil, Kerr-McGee, and Wyodak Companies (Volumes III & IV), Parts III, IV, V, and VI.

Present use patterns on all leases and their adjacent areas will be altered. Also, recreational access to these sites will be greatly improved. Considering these two facts, a change in types of use would probably occur on these areas (i.e., hunting to ORV use). Although net use will probably increase only slightly, some attempt should be made to determine the uses which will become most popular in the future.

The major activity to be impacted significantly by this proposal would be hunting on the Carter Oil lease north of Gillette. We note on page IV-119 that access restrictions to the area will be imposed by 1990. The types of restrictions and the resulting impacts these may have on hunting should be explored in the statement.

The leases granted to Kerr McGee and Arco are located in the same township. The cumulative impacts of these two leases on the surrounding area should be treated in the statement. Also the draft should specify the distance at which noise impacts would be damaging or annoying to recreational activities and wildlife.

In discussing the Arco lease on page III-88, under Description of the Existing Environment, recreation is discussed thusly, "Recreation can best be described as people doing things for their physical or psychological well being. There are few activities that occur on this lease area that serve these needs." We find the definition so broad as to be basically inaccurate. Conceivably one might undergo surgery or undertake psychoanalysis for his "physical or psychological well being." Overall, we regard the two sentence discussion as inadequate and possibly inaccurate in view of the facts presented on page III-118, under "Probable Impact of Proposed Action." It is indicated that mining will eliminate approximately 500 acres of hunting area and the 100-acre Reno Reservoir on a leasehold which is described as "virtually without recreation resources."

By the elimination of the recreation resources, opportunity for "physical and psychological well being" would be further curtailed.

The replacement of Reno Reservoir as a mitigating measure (p. III-139) is commendable. However, more detailed information would be desirable, including the parties responsible for this action, the impacts of construction, and the expected effect of the new reservoir on regional recreational use.

Significant Mitigating Measures, Ch. VI, and Alternatives to the Proposed Action, Ch. VIII.

"A rigorous exploration and objective evaluation of alternative actions that might avoid some or all of the adverse environmental impacts is essential," according to Council of Environmental Quality Guidelines. The discussion of mitigating measures for recreation (p. I-641) is wholly inadequate in that it merely restates statutory provisions without discussing their relation to previously identified adverse impacts. Definite mitigating measures should be described in the final statement. Included in the plans for constructing and operating the coal development facilities should be measures to minimize erosion and sedimentation, and specific plans for maintenance of sewage and waste treatment facilities. Since 26 percent of the recreational land from the project area will be committed to other use, some means of mitigating or replacing this loss should be discussed. Mitigating measures for meeting increased recreation demand should also be presented.

The discussion of "Alternative Reclamation Objectives" (pp. I-687 to I-692) is inadequate in its treatment of wildlife habitat, recreation, and multiple use. This section is in no way a rigorous exploration or an objective evaluation. The discussion of reclamation of wildlife habitat contains statements on erosion and sedimentation which are inconsistent with previous statements (see "Surface Protection and Reclamation," p. I-632, par. 3). Impacts identified with reclamation for wildlife habitat and recreation are all adverse with no consideration of either possibility as a mitigating measure or a beneficial use. The section on multiple use is a generality which is inadequate for an analysis of an alternative's impacts.

Analysis of Proposed Railroad Construction and Operation by Burlington Northern Inc., and the Chicago and North Western Transportation Company (Volume III) Part II.

The impact of the railroad on the development of other known potential Federal coal leases, privately owned coal, and other mineral resources should be discussed fully. The rail line is not inherently limited to use for the coal leases included in the study and, in fact, other potential resource developments are known (see Volume V, "Appendices," Maps 4 and 5). Increased transportation access could have an impact on

such developments and subsequent impact on all of the factors previously identified for the proposed action, including recreation.


The impact of the railroad unit on recreational access should be discussed more thoroughly. The degree to which recreational uses will be curtailed or disrupted should be determined and the anticipated reduction in use quantified. Measures to mitigate the adverse effects of limiting recreational access should be discussed.

The statement recognizes that recreation use generated by the population increase from railroad construction will cause overcrowding and deterioration of existing recreation facilities in Douglas and Gillette. A thorough analysis of the impacts which could occur on the various urban facilities should be included in this section.

Increased pressure on the existing urban facilities points out the need for long-term recreational planning in this area. Since the peak population (2,700) caused by this railroad line will not occur until 1990, this provides ample time for advance planning to alleviate any possible recreation shortages.

A detailed discussion of impacts on the Thunder Basin National Grassland should be added to the final statement. It is mentioned that this area has "good recreation opportunities," and that the proposed route crosses approximately 21 miles of the area.

We appreciate the opportunity to review and comment on this statement.



for James G. Watt
Director



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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80203

Ref: 8FE

AUG 9 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P.O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

The Environmental Protection Agency has reviewed the draft environmental impact statement entitled "Development of Coal Resources in the Eastern Powder River Coal Basin of Wyoming". We commend you for preparing this overview EIS as recommended in 1972 by our former administrator, Mr. Ruckelshaus. The following comments may assist you in expanding the scope and necessary detail needed to complete a revision of the document.

It is our view that although this document discussed numerous new industrial developments; coal mines, power plants, coal gasification plants, and a slurry pipeline, it legally satisfies Public Law 91-190, Section 102 (2) (c), only with respect to the railroad construction and the four mining plans upon federal coal leases. Our review initially discusses the adequacy of the information and environmental impacts due to these five projects, followed by review of the section on regional environmental impacts.

Burlington Northern-Chicago and North Western Railroad

The proposed construction of the BN/CNW Railroad between Gillette and Douglas, as presently designed and described in the EIS, will have a substantial negative effect on the livestock industry, wildlife, water quality, noise, and aesthetics of the region.

The number and locations of livestock and wildlife crossings of the right-of-way and fence line are inadequate to prevent substantial inconvenience and economic loss to the livestock industry and the recreational hunting sector. Wells and livestock ponds to be destroyed by the construction should be located on maps and mitigating measures to compensate for this loss described. Adverse effects upon livestock and wildlife from increased erosion, sedimentation, noise, and herbicide damage should be quantified to the extent possible. Such

impediments to antelope migration as the proposed fencing are a serious concern. Also the proposed route would isolate the area between state highway 59 and the railroad. Such a project will result in antelope deaths, deleterious inbreeding, and lack of access to forage when part of the range is under stress or overgrazed.

Water quality impacts will occur to ground and surface waters from chemicals, herbicides, oil or fuel spills, or disposal of sanitary wastes, according to the report, "even though adequate stipulations are included in granted easements or permits" (p. II-152). It should be the policy of the construction contractor to strictly adhere to permit regulations to prevent such accidental discharges. A section of the report should document the State and Federal regulations controlling these actions. There should be a specific commitment, with a proposed plan, to reclaim barrow pits, exploration cuts for construction materials, and waste disposal sites. Information is needed regarding the environmental effect (erosion, flooding, and water quality) of railroad induced drainage modifications. Compliance with the standards for NPDES permits for discharges emanating from railroad facilities and right-of-way, along with discussion of the technology adequate to comply, and alternative schemes for compliance, should be discussed.

The effect of fires created by the railroad is not adequately quantified. Between 1971 and 1973, 40 per cent (103) of the fires in Campbell and Converse Counties were railroad caused. This present system is 176 miles in length, compared to the 150 miles of new line proposed, and has significantly lower traffic density. Therefore we feel the estimate of 10 to 50 new fires per year, to be low since on a percentage mileage basis the new track could cause 90 new fires per year. This could also be higher due to the increased traffic flow. Preventive fire measures should concentrate on the source of the spark rather than in the fuel supply adjacent to the right-of-way. Alternatives to spraying herbicides should be analyzed. They include but are not limited to: placement of herbicide in the initial soil cover, periodic mowing, or controlled burning. Coal spilled along right-of-way should be recovered.

Air emissions at the anticipated level of rail traffic need to be discussed in terms of the impact upon ambient conditions and the issue of significant deterioration. The emission estimate should be included in a modeling estimate of ambient air quality for the region. (See subsequent comments regarding regional air quality modeling.)

The total noise impact from this project could have a significant detrimental effect upon the population centers near Bill and Douglas. Noise may also adversely effect livestock reproduction. It is possible, from the estimates given in the report, for a single location to receive over two hours of 98 decibel level noise per day every day of the week. (Based on 46 trains per day estimate of 1990 traffic flow.) A better estimate of the effects on livestock should be prepared and an analysis of compliance with proposed or adopted state and local noise regulations.

Alternative routing along the western route should receive additional evaluation. EPA favors this alternative route for the following reasons. This route would parallel an existing highway, thereby reducing the aesthetic impact on the region. According to the report it would also reduce negative effects upon livestock grazing, wildlife, recreation, and water quality (p. II-166). The western alternative route generally follows the ridgeline of the area therefore crossing most streams and gullies at a higher elevation which would reduce subsequent erosion. Fire damage might also be reduced for two reasons: the fire may be spotted sooner from the road and a fire would not spread beyond the road. The proposed route, unlike this alternative route, would isolate the wildlife range between Highway 59 and the railroad. We also urge further consideration of this route since it will pass through nine fewer miles of federally owned land.

In conclusion, we find the discussion of the railroad construction to inadequately address and quantify the impacts upon livestock, wildlife, water quality, air quality and noise. Additional information and maps are needed to describe and locate the major bridges, livestock crossings, sidings, new wells, disturbed wells and reservoirs associated with the project, in order to determine the impacts of the project.

Black Thunder Mine-Atlantic Richfield Company

Upon reviewing the draft EIS for the Black Thunder Mine we find the description inadequately describes the proposed plan; it does not sufficiently provide information on water quality impacts and land use impacts, nor does it provide sufficient detail of the proposed monitoring plan.

The description of the proposed project covers mining only in the center of the acquired lease until the year 2000 yet some of the impacts described cover the entire lease. This issue should

be resolved. Either the proposed mining plan should detail procedures for the entire lease or, preferably, only on the first 20 years of mining. At that time a new mining plan should be filed. This would be consistent with BLM stipulations that leases are subject to reasonable readjustment of terms on a 20 year basis. Then an environmental assessment should be prepared followed by a decision on preparation of another EIS.

Description of the mining procedure lacks the detail needed to determine if adequate reclamation procedures are followed. It is stated that toxic soils or overburden found to be deleterious to vegetation will be buried. Criteria levels used to determine this should be listed as well as operating control techniques used to accomplish this goal. Movement of trace elements after mechanical disturbance is not appropriately analyzed. Atlantic-Richfield asserts that, "Preliminary tests indicate the overburden does not contain any toxic materials", (p. III-46). Subsequent tables show zinc running between 90 and 240 ppm; strontium from 120 to 370 ppm; titanium from 1,100 to 3,500 ppm; and significant levels of vanadium, molybdenum, and uranium. Detailed analysis regarding mobility, toxicity, and concentration of these substances in the ground water and ecosystem should be included in the report.

This particular lease is adjacent to other federal coal leases to the south and north. The statement indicates these operations will not interfere with ARCO procedures. However, intercompany coordination of plans could reduce final high walls, eliminate reduction of facilities, or assist in both drainage control and monitoring. This mining plan should discuss these interactions.

Final land surface as shown in Figure II indicates no reduction of high walls. In order to comply with lease stipulations this would have to be reduced to a 4:1 slope. However, we recommend that in order to facilitate revegetation efforts and reduce water quality impacts, this be further reduced. To accomplish this and still recover the full amount of coal to the lease edge, BLM should consider granting special permits beyond the lease to acquire backfill material to knock down the remaining highwall provided there are no economically strippable reserves in this area.

Also to minimize environmental effects, we highly recommend that the initial out slope material be returned to the final highwall area to further reduce final slope of the mined area.

Water quality and quantity impacts could be severe at this location since the Little Thunder Creek crosses the lease. Estimates of average flow and maximum flow should be obtained prior to design of the mine in this area. If the mining plan cannot practically exclude

this area from mining, then several years of baseline data should be obtained to adequately design this area prior to mining. The four alternatives as presented in the report are not addressed in sufficient detail to determine impacts. Topography of each scheme should be mapped; and power use, sedimentation problems, downstream water use, and leaching impacts should be quantified and discussed. We feel that a reservoir acting as a sedimentation pond and pumping across the mined area is the best alternative provided power requirements are not unreasonably high. After mining is complete, restoration of the original stream slope through the mine should be achieved if possible. If not, deepening on the eastern side should be done to prevent ponding in the mined area. Regarding ponding in the exhausted area, under the mitigating measures section, it says, "upon shaping of the spoil into the final land form, no closed interior ponds should be permitted to form", (p. III-124). Yet Figure 2 shows five such depressions. We recognize it will be extremely difficult to eliminate closed drainages due to the overburden-to-coal ratio, and therefore much additional information should be prepared regarding these features. Aquifer tests should be used to determine the water budget of such ponds. Will these remain full, become alkaline, or will evaporation exceed infiltration? Drawdown in the uppermost aquifer from mining activity or subsequent leaching of toxic elements into the aquifer may have serious economic effects on local ranching operations. The company should develop plans to mitigate this harm not only by economic compensation but by offering to deepen and restore lost water supplies. Finally water consumption can and should be estimated and included in the final report.

Monitoring as described for this mine may be sufficient but additional features of the program should be indicated in the environmental impact statement. Air quality and meteorological stations should be located on a map, the equipment described, the duration of the data acquisition and most importantly the parameters measured should be stated. The same information is needed regarding the water quality monitoring system. Ten wells inside the lease and ten wells outside sounds like good coverage but these locations should be specified. Areas to be covered include ground water discharge areas, areas up and down gradient to underground flow, and on the perimeter of the drawdown areas. Of course the parameters monitored should be listed. A surface recording station might also be installed north east of the lease on the North Prong of Little Thunder Creek. These stations should be located on the lease map.

The socio-economic impacts of this project are also the responsibility of the company if it wants to establish good community relations and assist in providing company employees with a pleasant living environment.

Company officials should coordinate with local officials regarding transportation, housing, and water and sewage treatment facilities. If possible, the EIS should address alternative methods of providing front-end financial assistance to impacted communities.

In conclusion, we find the mining plan lacks the necessary information on the description of the proposal and the monitoring plan and does not adequately define the impacts upon water quality and surface disturbance.

North Rawhide Mine - Carter Oil Company

Our review of the mining plans as presented in the EIS indicates that, except for a few omissions, the plan adequately describes the proposed action. However, impacts to water quality, ground water supply, surface disturbance, and the monitoring systems to record these impacts are not adequately described.

The mining plan indicates the final high wall will be reduced to a 2:1 slope, the coal seam covered and area revegetated. The plan looks sound except the high wall should be reduced. However, since the final highwall is within Carter's lease it may not have to be reduced and could be carried on through the area during future mining. The plan indicates that 650,000 cubic yards of overburden from the initial boxcut will be placed in a ravine between clinker hills. This procedure will increase sedimentation, erosion and possibly leach toxic elements into surface streams. Rather than place the material in such a depression alternative dumping sites on topographic highs should be investigated. This material should be covered with topsoil and revegetated, then, upon completion of the mine, redeposited in the final cut.

Sewage and other liquid waste handling systems are not sufficiently described in the report. It is not appropriate to only state that, "sewage and liquid wastes will be treated in a waste disposal system in a manner that conforms to government requirements", (p. IV-31). A brief discussion of such regulations should be presented as well as a complete but brief description of the proposed system.

The plan indicates that 100 acres of the lease area is prime winter range for antelope, yet this area is not indicated on any map. Mitigating measures to offset wildlife impact should be included such as delayed mining in this area, if possible, or augmentation of range areas beyond the lease.

The description of unavoidable adverse affects indicates 4 wells, 1 spring and 6 small reservoirs will be destroyed. These

too should be located on a map and procedures to reclaim these necessary water supplies defined. Under mitigating measures it is noted that fences should be erected around active mines for safety and to provide continued grazing. The plan does not indicate this will be done.

The use of herbicides is indicated for two purposes; to control weeds along the railroad right-of-way and to control noxious and toxic species of invader plants in the mined area. Additional detail that needs to be provided regarding this procedure includes: name of target species, herbicides used, application rates, frequency of application and discussion of potential impacts.

Water quality impacts are not adequately described. According to the plan, water will be pumped from the seepage ponds in the active mine. This procedure, depending upon water quality, may require permit approval from this agency. Discharge permits must be approved 180 days prior to any discharge. An estimate should be made of the degradation of water quality from increased erosion and sedimentation. To reduce erosion and sedimentation it is noted that surface water will be diverted away from unprotected disturbed areas. A description of this procedure, and the procedure used to channelize Rawhide Creek and to prevent other runoff from entering the mine should be indicated. Rawhide Creek bisects the lease area; it is suggested that once channelized, mining be diverted from this area. In any event the original stream slope from mine entrance to mine exit should be maintained.

The impact due to the 500 acre depression within the mined area should be discussed. The plan indicates this will be a lake with sufficient water recharge from the surface mine to maintain a fresh water condition. A water budget which details aquifer discharge and total evaporation should be prepared from aquifer test data. Utilization of this lake for recreational or livestock water purposes should be included in the report if water quality is appropriate.

Decrease of groundwater supply in the area is not fully detailed. The report indicates the aquifers will be destroyed but the hydrologic characteristics of the replaced overburden are not described. Since the cone of depression will be beyond the mined area, 4 to 8 miles according to the statement, a contingency plan should be adopted to replace any wells which are lost. Water consumption can and should be estimated for the final statement. For instance, operations in Montana on a similar size mine of 5 million tons per year, indicate water consumption for all operations at 140,000 gallons per day. BLM should require the companies to make these estimates and indicate

the source of water.

Monitoring procedures are not fully detailed. Eleven monitoring wells are listed for the lease area but additional ones are needed to cover off site impacts. Several wells up and down gradient of ground water movement should be included. Distant wells should be dug at or near the extent of drawdown area and existing wells in the area should be monitored. Additions to the list of parameters to be measured should include the trace elements in the coal and the toxic heavy metals in the overburden. These parameters should include, in addition to these indicated: U, Mo, Cd, Co, Ni, Be, F, Se, Hg, Pb and As as well as pesticides. Location of the meteorological stations should be indicated. Air quality parameters should be listed. Since some diversion of surface waters is contemplated in the area of future spoils piles, frequent measurements for pH and common ions, periodic measurements for selected trace metals known to be present in the coal beds, and frequent measurements for turbidity and/or suspended solids and dissolved solids should be conducted.

Impacts due to surface disturbance are not fully analyzed so that the degree and duration of impacts can be determined. Since revegetation studies are not complete, there are no final plans. Reclamation success in five years is an unvalidated assumption. Some of the impacts which need to be quantified to the best extent possible are: boron toxicity to plants and availability of boron from overburden; toxicity to plants, livestock and wildlife to dust covered vegetation due to mine operations, potential of replacing wildlife browse; source of native seeds; and method and degree of topsoil replacement.

In conclusion we find the EIS regarding the North Rawhide Mine needs further delineation of the proposed plan, especially the monitoring system, and should fully analyze impacts upon water quality, water supply, and surface disturbance.

Jacobs Ranch Mine - Kerr-McGee Coal Corporation

Our review of the mining plan for Jacobs Ranch Mine indicates that the project is sufficiently described with accurate maps and tables to augment the report. However impacts upon water quality, water supply, land disturbance and a monitoring system to analyze these impacts are not adequately defined.

Description of the plan does not indicate if these procedures are coordinated with adjacent lease holders, especially with respect to channelization of North Prong Creek. The ARCO mine to the south plans to monitor this stream at its junction with Little Thunder Creek. Kerr-McGee should plan to use this data and place a gaging and water quality station above and below their lease. Present plans indicate a large high wall will remain along the north edge of the lease. This should be reduced. See the previous comments

about the ARCO mining plans regarding returning this area to a 4:1 slope with special permits granted by BLM to accomplish the procedure. Consideration should also be given to returning the initial out slope to this final high wall. Incidentally, maps showing final mine topography should show contours beyond the lease hold.

Water quality impacts should be more fully analyzed. It is planned to pump water from surface aquifers which flow into the remaining pits to a settling pond outside the lease area. The water will be treated, if necessary according to the report, before discharge. The general procedure is sound for this method, however, in order to determine the impact, the following information should be provided; estimate of amount and quality of water, criteria for requiring water treatment, and the method of treatment. It is stated that catchment ponds will be built where they are required and serve as settling ponds, livestock water ponds, and evaporation ponds. These uses may not be compatible. Location of these projects should be preliminarily indicated. A further description is needed to describe the projected perimeter ditching around the high side of the active mine. Where will this water be diverted? A permanent diversion ditch is suggested near the northwest corner of the lease to prevent runoff from entering the mine. The planned diversion channel for North Prong creek is neither located on an appropriate map nor its design indicated.

The source of supply and an estimate of water use for the mine are not indicated. This should be done in the final statement. Measures to replace lost wells due to mining activity should be included. A map indicating areal extent of serious aquifer drawdown should be prepared.

Impacts due to disturbance of the land are not fully assessed. The possibility of using overburden without topsoil is suggested in the report. A set of criteria used to make this judgement should be stated. The measures that will be taken to restore wildlife habitat must be indicated. The EIS only states what measures should be taken. (p. V-134). Kerr-McGee Corp., has provided a rather thorough trace element analysis of coal, (although mercury was not on the list), but an analysis of significant quantities and their potential effect on the ecosystem should be included.

Again the same general deficiencies as noted in previous mining plans pertaining to the details of the monitoring system are

omitted from this plan. The five monitoring wells which are already complete are not sufficient to cover water quality impacts. Areas outside the lease, especially down gradient, should also have monitoring wells. There are no parameters listed for these water monitoring systems. It should at least include those parameters listed by Carter Oil on page IV-36 of the EIS plus those suggested by EPA in the previous comments of page 8 of this report. Details of meteorological stations should be given and the inclusion of particulate data equipment is recommended. In conclusion, environmental impacts upon water quality and land use which occur as a result of this mining activity should be more fully analyzed.

Wyodak Mine - Wyodak Development Corporation

Our review of the mining plan for the Wyodak Mine indicates the EIS is inadequate in describing both the nature of the proposed mining plan and its impacts on the environment. Those areas not adequately described are the extent of the mining operation, description of the proposed power plant, the details of water control systems and the system of air and water quality monitoring. The impacts on water quality, air quality and land use are not described accurately or in sufficient detail.

This section of the report does not detail the area to be covered by the mining plan. The map on page VI-5 and the accompanying text indicates only 400 acres are covered by the plan. This area would be mined by 1988. Yet in subsequent chapters the impacts are given from mining on the entire lease, i.e. mining until 2012. Further, part of the impact section analyzes the effects due to mining on an entire township, most of which is beyond the Wyodak lease. This issue must be resolved. Either the mining plan is limited to the first 400 acres of operation or it should be expanded to give a map of mine development, description of final topography, high wall design, water control systems, monitoring stations, etc. for the entire lease area.

The new proposed 330 MW plant is not included in this impact statement. EPA believes this project is part of and contingent upon the sale of federal coal leases and approval of mining plans. Therefore a description of this project should be included within this report. Impacts from this new plant are significant and neither the public; nor EPA under its authority from the Clean Air Act, can determine the nature of these impacts unless the project itself is fully described. It is mentioned the EPA has granted a construction permit

for this plant. Actually until June 1, 1974 EPA acted as legal authority for the State of Wyoming in the issuance of new source review permits. This review is limited to compliance with federal and Wyoming air quality standards. (The Wyodak plant will comply if the planned precipitators are installed). They do not imply EPA review of the entire project as would a review of a draft EIS. The issue of including this power plant in the EIS should be resolved by BLM as similar facilities which utilize coal obtained from federal leases adjacent to these leases are planned by this corporation and other companies. As such these projects constitute a federal action which would "significantly effect the human environment." Therefore, in order to comply with the NEPA, this and similar mine-mouth power plants should be included in the EIS.

The plan neglects to describe in detail how water control systems will be designed. It mentions that Donkey Creek will be further channelized south of the area but maps locating this project, design cross sections, design flow, estimate of annual mean flow and the ultimate handling of this large drainage area are not included. The mining plan mentions the diversion of Donkey Creek around the mined area yet in the impacts section it indicates the creek will flow into the mined area. The statement on page VI-67 that, "Donkey Creek drops 80 feet at the highwall, then rises about 40 feet before it turns north, and finally rises another 40 feet at the burnline" is hydrologically incorrect. It does indicate that water would pond in the mined area. If mining does eventually proceed south through Donkey Creek other alternatives to handling this flow should be considered. Some alternatives would be to dam at the western edge or channelize to the northeast and then dam. Then the water could be pumped across, carried across on an elevated culvert or channelized through the mined area and the eastern portion of the stream deepened to prevent ponding.

Air and water quality monitoring systems are not described in the needed detail. Water quality data is listed for six unknown locations at Donkey Creek, Wyodak Pit, Ditto Lake, and three wells. The parameters measured should be greatly expanded. (See previous monitoring plan reviews in this report.) In addition the water quality parameters at this mine should include bacteria; total coliform, fecal coliform, and fecal streptococcus, since Donkey Creek flow is primarily effluent from the Gillette sewage system.

Water quality impacts as noted above could be significant at this location. An estimate is made regarding the water quality of the remaining 900 acre lake. It states that total dissolved solids could reach 6000 mg/l. A water budget and mass balance estimate for TDS

should be shown. It is suggested that a fishing lake could be created in this depression if Donkey Creek flow is diverted into it. What type of water quality problems or water rights problems downstream would this action create? The affected aquifers are "expected to return to normal after mine dewatering stops." This does not agree with previous statements of a 4 to 6 mile drawdown area. The surface aquifer will continue to dewater if seepage is less than evaporation. The water quality, economic, and social consequences of this action in the area should be fully analyzed.

It is stated that scrubber water with fly ash will be treated before recycling and these concentrated wastes put in a settling pond. Yet our understanding is that the power plant will have only a dry control system, i.e. electrostatic precipitators. However if a wet system is proposed, preferably the wastes should be dried, stabilized, and returned to the mine. If a settling pond is used instead, it should be lined or sealed and of sufficient capacity to prevent any overflow.

Air quality impacts from this action will cause some deterioration of the present air quality. There is no apparent reason to list power plant emission without controls. This would violate New Source Performance Standards for steam generators. The impact section states that the health of the local population would be seriously affected. The condition described resembles a severe London smog alert. This is not the case. Actually according to the Northern Great Plains Resources Project report on atmospheric aspects, the estimate for maximum ground level annual concentrations for the Wyodak plant are minimal compared to the National secondary standards. These concentrations for particulates, SO_2 , and NO_x in ug/m^3 are 0.1, 1.3, 0.7 respectively. National secondary standards for these pollutants are 75, 80, and 100. (NGPRP, Work Group D Report, Atmospheric Aspects, p. 188.) Thus the emissions given and impacts stated are misleading.

Other aspects of air pollution are not discussed or accurately analyzed. An estimate should be made of the quantities of the trace elements contained in the coal that are released to the atmosphere. An attempt should be made to quantify the impact of fugitive dust emissions from the mine. A 40% retention of SO_2 in the boiler seems unrealistically high; present figures indicate SO_2 retention of 15-20% in the boiler.

Impacts from surface disturbance are not fully addressed. The report mentioned previous experiments on revegetation in the South pit. The results of these experiments to date should be included. Maintaining a final slope of 35° will be too steep to facilitate reclamation plans so a reduction to 11° as proposed should be accomplished. It is not clear from the plan exactly what is planned regarding reclamation. The EIS states that approval of the plan will probably be based on

recovery of the top 12 inches of overburden as soil material. Has this issue been decided? According to the report, the State of Wyoming must agree to plans for the interior depression and possible lake. Has this been done? The report says only 57% of the mined area can be reclaimed since 43% will have interior drainage with playa-like conditions. This percentage of reclaimed land appears to be unusually low. A better method is to plan for depressions in the mined area and minimize the areal extent of these areas. The final topographic configuration for the mined area and the undisturbed adjacent land should be shown in the final EIS.

In conclusion we find that this section of the EIS to be inadequate in describing the proposed action in the analysis of the environmental impacts affecting water quality, air quality, and land disturbance.

Regional Analysis

The preparation of this regional EIS is a commendable effort and a needed one. It represents an initial attempt to assess the interrelated activity of the industrial development of eastern Wyoming. The report indicates resources of this region are expected to supply eighty per cent of the expansion in coal production for the United States by 1980. (p. I-31). As such, it is the most important expansion of energy resources for this county in this decade. The assessment therefore should be a thorough, accurate, and complete report on this vital product.

Water Resources

All fresh water within the area, whether ground water or surface water stream, is a scarce, precious resource which, even if managed as carefully and conscientiously as possible, places constraints on development.

The demands this industrialization will place upon the region's water resources are not quantitatively addressed in detail. The statement concludes that little, if anything, is known about the demands that the Powder River coal operations will have on the amount of water which will be consumed.

For instance, water demands at mining facilities, though relatively small, are not estimated in the report. Results from similar mining in Montana indicate a 5 million ton per year operation will consume approximately 140,000 gpd or 160 ac-ft/yr. These estimates could be carried through for the region.

Another revision in demand is that associated with industrialization and urbanization in the entire source area. This includes the western Powder River Basin and the Cheyenne River Basin. Estimates of these water demands should be included and the supply and impacts of water use analyzed over a constant region.

Water sources in this region are governed by prior appropriative rights. The generalities regarding water rights in the statement do not permit quantification of water supply. The statement gives the impression of water scarcity - " ... during most years only those rights with a priority dating before 1900 have a dependable water supply during late summer months." (I-258). There is no table to show what this means in terms of acre-feet and the number and location of water rights. What percentage of the rights have a dependable supply? How many water rights are located in northeast Wyoming and how would they be affected with new dams and ground water wells? There are suggestions that present surface uses might suffer significant impacts, but where and by how much? The statement says the amount of water to be obtained from surface and ground sources cannot be determined and that each company, within legal constraints, will develop their own water. (I-490-491). This environmental impact statement does not assess water use impacts with specific knowledge.

The water table will be lowered in the region due to the mining activity. Since the present water surface is shallow, shallow wells which are the main source for the livestock industry will be easily affected. Drawdown area estimates of 6 to 8 miles may be low in light of recent studies of similar conditions in Montana. These studies indicate minor drawdown out to 20 miles. The estimate that the basin receives 150,000 ac-ft/yr as recharge should be documented, located within the region, and the impacts addressed of tapping this source of water.

The main impact on water resources will not only be from consumptive use in this region, it will also include local degradation of water quality. The statement says, "Precise changes and concentration of dissolved solids in surface water cannot be predicted at present. Further studies including applied research and monitoring are needed." Doesn't this imply that additional time is needed to analyze these changes? "The total effect on regional quality cannot be assessed with data currently available. Monitoring systems will be necessary to determine actual impacts on water quality." In view of the inadequate baseline data, the EIS should address the need for a comprehensive water monitoring system that will collect adequate baseline data.

Water quality monitoring systems have been reviewed in detail in the previous section relative to the mines, but a regional approach is needed here and the announced plans of the USGS to complete this system are not detailed in the report.

Some of the more important sources of water pollutants that are not addressed fully in the report are: accumulation of salts and toxic elements in low areas of the mines and their movement either through the aquifer or when pumped down natural drainages; leaching of chemical constituents not readily available in the stratified overburden that are suddenly available when the overburden materials are stripped and replaced in an unstratified condition; discharges from wet pollutant control systems from power plants, and the cumulative sediment increase from regional construction activities. It must be noted with concern that the EIS gives no indication of whether or not there will be any difficulty in meeting NPDES permit requirements for run-off water and waste water discharges; in fact, the statement does not indicate how compliance with NPDES standards will be achieved.

The questions of both water quantity and water quality have not been treated satisfactorily in the Powder River Basin Environmental Impact Study.

Air Quality

The Air Quality impact analyses presented in the EIS were extremely qualitative and inadequate. It is difficult to arrive at the same conclusions as the statement does regarding the severity of short and long term impacts based on such qualitative discussions. Air quality diffusion modeling should be employed to provide a more quantitative assessment of the possibility of violating the National Ambient Air Quality Standards. Granted that site specific data on air quality, meteorology, air pollutant emission rates, stack parameters, etc. are not available, but reasonable assumptions can be made to provide the necessary data input for the models. Modeling results could conceivably point out potential air quality problems. The Northern Great Plains Resource Program Work Group Report on Atmospheric Aspects, which includes a section on point source diffusion modeling for selected power plants and a "model" gasification plant, may provide useful information.

Even without such modeling efforts, the report does make an estimate of ambient air quality for particulates, but the negative aspects are apparently over estimated. Page I-468 reads, "Present ambient air quality is

considered good (24 hour mean suspended particulates range from 13 to 60 micrograms per cubic meter of air, ug/m^3) versus a national primary standard of $75 \text{ ug}/\text{m}^3$, but it will decline with the development of complex pollution sources as industrialization takes place (24 hour mean suspended particulates could increase to a range of 20 to $200 \text{ ug}/\text{m}^3$). It is not clear how these ambient air quality estimates were obtained. This should be shown in the report. The conditions stated would exceed the national 24 hour secondary standard of $150 \text{ ug}/\text{m}^3$. In addition resolution of the "significant deterioration" regulation may affect whether or not total development will be allowed to occur.

Some of the problems noted in the discussion on air emissions from power plants include: estimates of SO_2 emissions are low and must have assumed only 0.3% sulfur coal, (p I-647), and the assumption of no stack emission controls is unrealistic. New coal fired power plants must comply with both State and Federal emission regulations, which include the Federal New Source Performance Standards. Also an air pollution table (p. I-649) calculates the emissions for the Casper and Wyoming Intrastate Regions which covers nineteen counties or ninety percent of the state. It compares the new pollution sources which could come from plants in Converse and Campbell counties to the larger region. The statement leaves out the percentage increase from present to future pollution levels in the Powder River Basin. This table misrepresents what will happen to air quality in the Study Area of Campbell and Converse Counties.

Other aspects of air pollution sources are not evaluated. An attempt should be made to estimate the fugitive dust emissions resulting from strip mining activity. An analysis of the effects of gasification plants on air quality should be included. Hydrocarbon emissions from these plants may well produce a very serious smog problem because of NO_x -HC photochemical reactions. There is no apparent reason to include CO_2 emissions from gasification plants as this is not a pollutant but a major component of the atmosphere.

Land Use

The major impact upon the land will be the lowered elevation as a result of disturbance due to the surface mines. Mitigating measures to help alleviate some of this impact, as indicated in the review of the specific mining plans, can be extrapolated to the region as a whole. In addition there should be a coordinating effort to reduce land impact between mines. A variety of consequences result from the random development now occurring which could be eliminated with coordinated planning. Adjacent mine facilities could share portions of

a monitoring system or data from such systems, remaining high walls could be carried over to adjacent leases, mines could be developed so they do not have simultaneous impacts such as ground water drawdown, and most importantly, the companies involved could coordinate their assistance to local governments.

Reclamation procedures are admittedly an unknown activity according to the report, therefore an effort must be made prior to mining to develop sound reclamation techniques. The mining companies should have a better idea than they do at present about what measures are necessary to assure that revegetation is successful. Soil and overburden tests should be taken before mining. The results of revegetation at the AMAX mine and the Decker Mine in Montana should be made available to all companies. Coordination of these efforts with experts from the Soil Conservation service, National Forest Service and university personnel with BLM and the mining companies should be accomplished.

Some of the specifics presented as fact or assumption on reclamation procedures should be further analyzed. One of the key assumptions is that mined land will be reclaimed in five years. This may be somewhat optimistic if this implies that unaided regeneration will occur. These lands should be protected from livestock and wildlife grazing until they are fully recovered. Extrapolating data obtained from revegetating abandoned farms is not valid as conditions are vastly different. Incidentally, such figures are not very encouraging, since abandoned farms had not completely recovered to original conditions after 50 years. However, mining companies should be able to economically justify the expense of intensive revegetation efforts since it is such a small fraction of coal revenue. If proper procedures are taken in replacing spoils (such as burying toxic and saline materials, reducing slopes, and top soil replacement) and are combined with an intensive seeding effort (mulching, fertilizing, irrigating, and seeding with a variety of native species) then revegetation should succeed. A firm commitment from industry is needed to assure that this goal is obtained.

An aspect of land use completely overlooked in this regional analysis is the need for development of transportation and utility corridors, BLM should lead in this endeavor to plan now for this land use. Proper planning not only can reduce environmental and aesthetic impact, but provide for orderly and timely development.

A recommendation that a regional archaeologist be hired by the mining companies would be of benefit. Investigating the region's very significant historical record is important to educational and cultural values.

Wildlife impacts will be significant and mitigating measures need

to be undertaken. Since disturbance of mined land could have an impact three to five times larger than the area disturbed, industrialization and urbanization will destroy habitats, air quality and noise impacts will disrupt wildlife, and the increased population will further reduce wildlife productivity; it is imperative to outline some measures to protect this regional resource. In addition, there will apparently be a disruption of existing interrelationships with big game species and birds declining and rodents and predators increasing. Such measures as removing non-mobile species prior to mining, augmentation of present habitats, and reduction of hunting pressure need to be developed into a basin-wide plan.

Socio-Economic Impact

The rate of industrial development and the improved methods of providing front-end money are critical elements in alleviating many of the adverse effects upon the local communities. The proposed rate of expansion implies that the region will encounter difficulty in meeting the anticipated needs in public safety, health, recreation, social and medical services, schools, transportation, etc.

Prior experience with rapidly developing economies indicates that tax revenues lag behind these anticipated needs. The present way of life in these communities could be put under considerable stress. The quality of human services will be affected by quick growth. Shortages of trained personnel will occur. Rapid turnover of qualified staff will result from understaffing and overworking employees. A curtailment of services is possible. Limited recreational resources exist in the area. The influx of new people to the area and the associated development has been predicted to have a detrimental effect on game population, e.g. antelope.

Under similar rapid growth conditions, the area near Rock Springs, Wyoming has suffered. According to a report by the Denver Research Institute, housing, health services, recreation and educational facilities all lag far behind the needs. Under the present legal constraints, there may be no hope of ever catching up. According to the same report, rapid growth has also reduced industrial productivity. High turnover rates brought on by such social problems as housing shortages have caused a substantial drop in the productivity of both mining and construction industries. (See "The Sweetwater County Boom: A Challenge to Industrial Growth" Working Paper for Revision and Review, University of Denver Research Institute, July 1974).

If these conditions are to be avoided in Campbell and Converse Counties, then industrial development should proceed contingent upon a workable plan to maintain the quality of human services now and in the future. In order for such a plan to succeed, company officials should coordinate with state and local officials regarding company expansion, community facilities, and assist in development of a financial assistance program. The extent of this type of company-government planning should be shown in the final statement, especially in regard to new-town development.

Alternatives

The section on alternative activities in lieu of coal production is an excellent review of some trade offs that need to be made regarding energy production, the economy, and the environment.

The alternative of further developing eastern coal should be analyzed to develop an economic and environmental comparison chart between it and western coal. Eastern coal contains 34% more BTU's per ton and approximately 20% of this coal can be pre-cleaned of sulfur to bring it down to 0.7% S. Transportation cost would be reduced by utilizing eastern coal as it is closer to the power demand areas. Also there is an existing social structure based on mining in this region which could benefit from more jobs in that region. This is a national decision that should be based on minimizing detrimental human and environmental impact as well as maximizing energy production.

The real alternative for this region, however, in terms of reducing negative impacts, is to lower the rate of production. If the Carter Mine is taken as representative, then at this rate of production (5.1% of the coal depleted by the year 2033) then all of the economically strippable coal could be removed by 20 such mines before 2050. What kind of legacy would the coal industry leave upon this land? A slower rate of production of this vast resource not only would mitigate harsh impacts in the beginning but would mean the region could be stable over a longer period as the coal is slowly developed. The report states that restricting development would not lessen the total impact on the physical resources but it might allow for future technological improvements (in reclamation, on in-situ techniques, pollution control, etc.) to be developed. These new technologies could serve to lessen impacts on physical resources. In addition, new requests for leasing can be administratively delayed pending the results of Interior's Programatic Coal Leasing Program. We highly recommend the "restrict development" alternative.

Alternatives to the coal slurry pipeline aren't only limited to other transportation mechanisms but include alternative transport media in the pipeline. Hydrogenation of coal might be a viable alternative to water. Also, since the region exports oil, this might be an economic pumping media rather than mining water for this purpose.

Conservation of energy might develop into a strong national policy with tax incentives as well as voluntary compliance programs. This will probably not affect the region in the short run, however, a successful program may significantly reduce industry demands for additional leasing and this could assist the accomplishment in the future of the "restrict development" alternative.

Errata

The following errors were noted.

PAGE _____

ERROR

I-31

The production figures should be thousand short tons rather than short tons

I-580

reads, "enrollment increase by 166.4% from 3,022 to 8,050 students" should be 268%

I-468

The quoted standard of $75\text{ug}/\text{m}^3$ is the primary annual standard. It was erroneously compared to the 24-hour average concentration. The 24-hour primary standard for particulates is $260\text{ug}/\text{m}^3$.

I-612

Much of the material found in the Air Quality section was from the Atmospheric Aspects Work Group of the Northern Great Plains Resources Program. This report should be referenced. Tables 1, 2, 3, were taken from the report. The footnotes on Table 2 (p. I-615) were omitted.

I-612

The last sentence on this page is incomplete. Add to the last line, "monoxides and hydrocarbons were promulgated by the Environmental Protection...."

I-649

The 1970 column figures are carbon monoxide. The 1982, 1985, and 1990 figures are carbon dioxide. A comparison is meaningless.

I-698

reads, "Consumptive use (by the railroad) of 90,000 acre-feet of water per year would also be required." This amount of water use should be clarified.

III-25

reads, "Air Quality data concerning mixing heights are contained in Table 5, Chap IV Part I," should be Table 6, Chap IV Part I.

IV-146

Table 1 reads under 1970 Base for Particulates - "23,510" should probably be "26,510."

V-23

This section indicates that air quality over the lease is described in Chapter IV-Part I, but this section does not describe the air quality near this lease.

Conclusion

Prior to completion of the final EIS, we recommend the BLM secure additional data sources that are available regarding Powder River coal development. Much of the work done under the Northern Great Plains Resources Program is now available. Company plans and experiment results also contain additional necessary information. Further, proposed legislative action on strip mining may become law in a few months. Two different versions of proposed strip mining regulations have passed in the House and Senate. Among the provisions that could be in the final bill are: either an outright ban on mining on land with split ownership (private surface-federal coal) or requiring surface owner agreement on such land; restricting mining where the land cannot be reclaimed; a provision to restore the land to its "approximate original contours"; and a moratorium on mining in National grasslands. BLM should thoroughly review this new proposed legislation and particularly review its impact upon this region if it becomes law prior to the filing of the final EIS.

We find that this EIS does not comply with the standards set by law under the National Environmental Policy Act to evaluate the environmental affects "to the fullest extent possible," and to make a full and accurate disclosure of information nor does it comply with Department of Interior guidelines that a statement should be comprehensive.

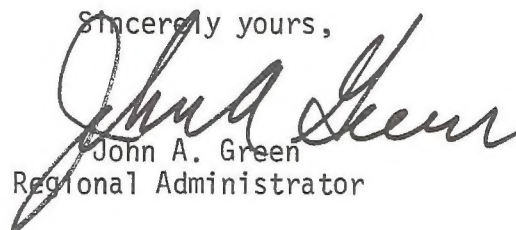
As the Court in Calvert Cliffs' Coordinating Committee v. Atomic Energy Commission, 449 F.2nd 1109 (D.C.Cir.1971), cert.denied, 404 U.S.942 (1972), stated "(T)he requirement of environmental consideration 'to the fullest extent possible' sets a high standard for the agencies..." Inasmuch as a decision of an agency must include a good faith consideration of the environment, in our view, a statement is inadequate if it gives insufficient weight to environmental issues. Of course, to give sufficient weight to environmental issues "to the fullest extent possible" is not an absolute term requiring perfection. However, as the Court in Environmental Defense Fund, Inc. v. Corps of Engineers, 348 F. Supp. at 927 (USDCDC, 1971) stated "an agency's consideration of environmental matters that is merely partial or performed in a superficial manner does not satisfy the requisite standard."

We thus find this draft EIS unsatisfactory. It does not adequately describe the specific projects and the proposed future projects in the regional analysis; it does not sufficiently detail the impacts that will occur to the air, land, and water resources; and it does not adequately address mitigating measures which could offset these impacts.

Based on the rating system that EPA has developed for rating of environmental impact statements, the Draft Environmental Impact Statement for the "Development of Coal Resources in the "Eastern Powder River Coal Basin of Wyoming" will be recorded in the Federal Register in Category 3. The agency requests more information and analysis concerning the potential environmental hazards and asks that substantial revision be made to the impact statement.

If you have any questions regarding our review, please contact this office.

Sincerely yours,


John A. Green
Regional Administrator



DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

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AUG 7 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

The Draft EIS - "Eastern Powder River Coal Basin of Wyoming" has been reviewed in this Department. We have received specific comments from the Soil Conservation Service and units of the Forest Service. For convenience, copies of those comments are enclosed. We do have some thoughts on those comments.

It is appropriate that the role of SCS be shown in the Final Statement. That Agency is in a position to give valuable assistance in the soils and vegetation aspects of surface mining rehabilitation.

We agree that "topsoil" should be described, but feel this should be done in the glossary, rather than in the text as is suggested. The remainder of the comments are worthwhile and should be considered.

Forest Service comments point up two areas of concern. First, the magnitude of impacts could better be reflected if put into perspective by showing percentages of land disturbance and removal from other uses. Second, there is concern as to the impact on endangered species, especially the black footed ferret. Since prairie dogs are an important part of the ferrets' diet, an attempt should be made to determine and locate "towns" that will be disturbed, thereby reducing the ferrets' habitat.

The remaining comments have value and should be considered in preparing the Final Environmental Statement.

The Economic Research Service received a copy of the Draft Statement too late to meet the response deadline. ERS is working on the matter now. I have asked the Forest Service to forward any ERS comments directly to you to save time.

Sincerely,

FRED H. TSCHIRLEY
Coordinator
Environmental Quality Activities

VII-902

Enclosures

DRAFT EIS - Eastern Powder River Coal Basin

VOLUME I

Volume I, page I-9

We take strong objection to the last paragraph on this page that the GS is the principal federal agency concerned with preparing maps of the physical features of the country and providing earth science information essential to use and conservation of the nation's land, mineral, and water resources.

Soil surveys prepared by the SCS have been completed for more than half of the land in the country. They are much more detailed than the geologic surveys and provide extensive data which permit interpretations of the erodibility of soils and their nutrient content and available water capacity. Such interpretations either cannot be made at all, or can be made only in very general terms, from geologic surveys. In addition, soil surveys provide extensive data about the engineering properties of soils and relate soil properties to the expected performance of soils in many land uses. This information is essential to the use and conservation of the nation's land and water resources.

Volume I, page I-9

The SCS should be listed among the federal agencies, and its role discussed. Much of the surface is privately owned, e.g., of the 18413 acres in the four specific applications, 11809 acres are privately owned. Practically all SCS technical assistance and soil survey activities are carried out on private lands, thus, its programs are extremely useful and beneficial in maintaining and improving land productivity and enhancing environmental quality.

Volume I, page I-12

The soil and water conservation commissions and soil and water conservation districts (subdivisions of state government) should be listed among state agencies.

Volume I, page I-59

Assumption 2 should read something like:

Mined areas will be reclaimed to their maximum use potential, whereby the best suited soils and geologic strata are properly placed in the final grading.

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There will not be a 50% loss in productivity for grazing if such placement of materials is accomplished. For some of the area there will be an increase in productivity.

An additional assumption should be included, following assumption 2:

3. Plans for placement of soils and geologic strata will be based upon data provided by detailed soil surveys and analyses of geologic strata from which the materials best suited for plant growth are identified.

Volume I, page I-61

It is essential that "topsoil" be defined here. The following definition is proposed: As used herein, topsoil refers to the A horizons, and those portions of the B and C horizons that are favorable, for the growth of plants. These horizons are defined by detailed soil surveys prepared by the Soil Conservation Service and cooperating federal and state agencies of the National Cooperative Soil Survey.

Volume I, page I-62, paragraph 3

Delete the first sentence. Replace with paragraph as follows:

The nature and thickness of available topsoil shall be determined by detailed soil surveys of prospective mining sites. Grading plans will be based on the data thus provided. The objective of such grading shall be to create the soil best suited for plant growth, making optimal use of the available soil materials.

The research contracts investigating possible use of "other subsoil strata" result largely from the fact that it would be cheaper, and generally not because of "lack of well-developed topsoil zones." If it is pertinent to include the ideas of the last two sentences of this paragraph, which we seriously question, the paragraph should begin, "A number of mining companies have contracted with research organizations to investigate possible use of various geologic strata in the overburden to support"

Volume I, page I-78, paragraph 1

The essential idea in this paragraph is incorrect. There is little variation in climate in the two counties. The climate is a fixed or "given" condition, and there is no prospect for changing it.

This discussion should focus on the key to rehabilitation in a given climate, i.e., the soil, as properly stated by the quote from the NAS study committee.

Volume I, page I-80, paragraph 4

The reclamation objective stated is too limited in scope. Reclamation objectives are to leave soil of such a quality that the land has the maximum number of alternative uses and the maximum productivity for priority uses, including the growth of plants necessary to maximize environmental quality after mining.

Volume I, page I-85, paragraph 3

The listing of agencies should include the Soil Conservation Service.

Volume I, page I-144, line 3

Change "these soils" to "the clayey soils of the area." Certainly all the soils aren't easily compacted and highly susceptible to shrink-swell.

Volume I, page I-144, 145

The discussion of the soil association map and its interpretations is interwoven with incorrect statements and indefinable negative implications, e.g., the fact that all data available, including that "dating back to 1953," was used in compiling the map is said to make its accuracy questionable. This factor does not affect the accuracy of the map, as all data was interpreted using up-to-date standards. This statement, as it now appears in the text, is entirely false. Soil associations are not "grouping of soils," and the implications that emerge from this assumption are also erroneous.

Reword beginning with paragraph 3, page 144, down to soil association descriptions, page 145.

It is a well accepted fact that the prospect for successful rehabilitation is closely dependent on the nature of the soil left in the upper few feet of the graded land surface after mining. The soils of the area vary widely in their suitability for use as final cover for mined areas. In order to determine the nature of soils and make specific grading plans to assure creation of optimal soil conditions after mining, a detailed soil survey of the prospective site is necessary. From this survey, the thickness of soil horizons favorable for plant

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growth may be determined as well as: (a) information about soil texture which will influence difficulty of grading, slope stability, shrink-swell hazards, and erodibility; and, (b) soil pH, salt content, and level of plant nutrients which will influence selection of adapted plants for revegetation and the need for fertilizers and irrigation to establish and sustain them.

It is beyond the scope of this document to go into extensive detail about all of the kinds of soil in Basin. However, a map of soil associations was developed for the study area (Vol. 5, Appendices, Map 7). Information from all previous studies of soils in the area, including the published Soil Survey of Campbell County, Wyoming (USDA, 1955), and scattered soil surveys and related studies and in Converse and other nearby counties was used in compiling this map.

The soil associations are areas that have a distinctive pattern of soils and landforms. As a result of the kind of soils and landforms, each of these soil associations has a distinctive set of use potentials and limitations for specific uses. The information provided is of value to general, or broad-scale, land use planning.

Soil associations are named according to the most extensive soils within each. Although the soils at specific sites are not identified on the Map of Soil Associations, the dominant soils are identified. Soils of minor extent, with properties which differ widely from any of the most extensive soils, occur in most of the soil associations and would be identified in the detailed soil surveys required for site planning.

In Table 8, descriptive and interpretive data is provided for each of the most extensive soils mentioned in the names of the soil associations. For each of these soils, the following data is included:

classification	potential forage production
typical texture of surface layer	degree of limitation and
parent material	soil features affecting:
natural soil drainage class	- irrigation
depth of rooting zone	- dwellings
available water capacity	- final cover for mined
permeability of the least	land inches available
permeable layer	suitability
potential frost action	- transportation routes
hydrologic soil group	depths of surface layer
erodibility	soil reaction (pH)
inherent fertility	salinity

In addition, Tables 10 through 28 of Appendix C, provide soil series descriptions and engineering classifications (AASHO and Unified). The map of soil associations and detailed soil surveys will provide information of value in identifying soil hazards or potentials of significance to the location of sites for processing plants, roads, and housing, and other urban developments that will be needed to support expanded levels of surface mining.

Volume I, page I-248, paragraph 2

The intended meaning is complicated by the choice of words. It would be better to say: The stream channels in the area of prospective coal development consist of unconsolidated cohesive or non-cohesive materials that can be transported by the stream. The last two sentences are O.K.

Volume I, page I-268, paragraph 2

The reference to "zootic" climax should be deleted. This is a controversial concept and has no real bearing on the vegetation discussions that follow.

Volume I, page I-269, paragraphs 2 and 3

Here and through the entire statement the term "vegetative type" is used. The correct term is "vegetation type."

The specific name for tufted hairgrass is misspelled, it should be "caespitosa." Scientific name for bearded wheatgrass should be "Agropyron subsecundum."

Volume I, page I-269 through I-277

Discussion of vegetation of the area under consideration does not make clear if present or potential plant communities are being described. It would be better if both were described. SCS range site descriptions would be useful for this purpose. They would likewise be appropriate since most of the surface area in question is privately owned.

Volume I, page I-270, paragraph 1

The specific name for mat muhly is misspelled, it should be "richardsonis."

Volume I, page I-271, paragraphs 1 and 2

Genus name "Boutelona" misspelled. Also "psammophytic" misspelled. Genus name "Koeleria" misspelled.

Volume I, page I-273, paragraph 3

The word "goldmaster" should be "goldaster."

Volume I, page I-274, paragraph 2

Genus name "Distichilis" is misspelled.

Volume I, page I-276, paragraph 4

Specific name "horizontalis" misspelled.

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Draft EIS - Eastern Powder River Coal Basin

VOLUME II

Volume II, pages I-475 to I-478

This entire section is apparently written with the underlying assumption that the A horizon and portions of B and C horizons favorable for plant growth (topsoil) will not be graded over the spoil. Yet earlier portions (e.g. page I-61) assume that it will be replaced. Thus the section should be redone to be consistent, and should assume that "topsoil" will be replaced. Many changes are required if this is to be done.

Volume II, Page I-545

Should the Annual Livestock Forage Lost be AUM's, not acres/AUM.

Volume II, page I-624

Level to gentle slopes can also be reclaimed for non-irrigated cropland.

Volume II, page I-627, paragraph 2

This is written with the apparent underlying assumption that topsoil will not be graded over the surface. Thus, it is inconsistent with earlier stated assumptions.

Volume II, page I-629

A definition of topsoil is needed here.

Volume II, pages I-629 to I-633

SCS experience and technical guides are not mentioned in relation to revegetation. It appears that such expertise and information could be cited here.

Volume II, page I-630

The statement about topsoil being loose, friable, and susceptible to erosion is too broad. It may be, depending on its texture, organic content, and grading methods.

There are many cases where mulches are highly effective where annual precipitation is much more than 14". The essential point is that there may be no prospect of obtaining satisfactory vegetation where precipitation is less than 14 inches without using mulches.

Volume II, page I-633, fertilizing

Maintaining vegetation does not depend on soil development. It depends upon the properties of the soil left at the surface, especially its pH, salt content, and ability to supply available water and plant nutrients. Applying manure, etc., will enhance or improve the soil's capacity to supply plants with water and nutrients. Over a period of ten thousand years it will no doubt influence the formation of the soil.

Volume II, page I-651, paragraph 2

Assuming that topsoil is graded back over the spoil, the new soil will not be "totally unlike" the soil before mining. It should have a number of important similarities, and its best management expected performance will be similar in many respects to the original soil. This is, in fact, one of the vital advantages of replacing the topsoil, in that existing knowledge about specific soils and kinds of plants adapted to them can be applied in revegetation practices with good prospects for success.

Volume II, page I-655, paragraph 3

It is incorrect to say that "plant succession will be destroyed." It will be interrupted or caused to change direction due to the severity of the of the disturbance. It is also faulty to predict that vegetation will return to present state in 50 or more years. Due to the severity of the disturbance, the original plant community may never return. A new site is created and therefore, a new "climax" vegetation.

Volume II, page I-862

The "better soils" will be stockpiled and graded back over the surface, according to earlier assumptions (page I-61). Thus, this paragraph isn't consistent with the rest of the report.

The greatest loss will be soils on which the facilities are built. Even though the topsoil is graded over the final spoil, there will be a loss of soil micro-organisms and plant seeds in the surface soil and a loss of the natural soil structure.

Draft EIS - Eastern Powder River Coal Basin

VOLUME III

Volume III, page II-91

It would be desirable to include in this section some reference to stockpiling the organically enriched A horizons from the area to be covered by the railroad, and that from adjacent cuts or below adjacent fills, for use in blanketing the cuts, fills, and other disturbed areas after construction is completed.

There would be little need to stockpile material from the B horizons to grade over the cuts and fills as much of the material exposed thereon would be from B horizons. Thus, the appropriate definition of "topsoil" used in relation to the railroad construction should include only the A horizons of the natural soils, whereas, "topsoil" for use with surface mining should include the A horizon and those portions of the B and C horizons that are favorable for plant growth. A tightening-up of these definitions is badly needed in this EIS.

Volume III, page II-131

The points raised on page II-91 also apply here.

Volume III, page II-134

SCS technical guides could be referred to for revegetation work.

Volume III, page III-31, paragraph 1

The first three sentences may stand but the rest of this paragraph is misleading and should be rewritten. The following wording is proposed:

"Each delineation also includes several soil series, other than those mapped or mentioned, due to their minor extent.

"Although the field work was completed in 1939, the data obtained was sufficient to prepare modern soil interpretations of the soil series and mapping units delineated. In view of the rather general nature of the 1939 survey, detailed surveys must be conducted on the leased area and adjacent areas in order to properly evaluate impacts on the soils, the relationships to the existing environment, and to plan for the most effective mitigating measures."

Volume III, pages III-68 to III-75

The "ecosystems" described here read much like range sites. It would seem appropriate to use SCS range site descriptions for this and similar sections since a very high percentage of the surface acreage is privately owned and all which are under district agreement probably have range site and condition inventories already.

Volume III, page III-145, paragraph 2

Same comment as that for page I-651, paragraph 3 - unsuitable for what? The intended meaning needs to be clarified.

Volume III, page III-193

This discussion apparently assumes topsoil is not graded back over the spoil, and is thus inconsistent with earlier assumptions. It should evaluate the suitability of soils available for topsoiling, and discuss impacts from the standpoint that the topsoil was returned.

DRAFT EIS - Eastern Powder River Coal Basin

VOLUME IV

Volume IV, page IV-42, para. 1

The same comments as for page III-31, Vol. 3, apply here, after the first sentence.

Paragraph 2 -- The statement "Although each of these mapping units was not studied nor mapped individually in 1939" is incorrect and should be deleted.

Volume IV, page IV-46

The last statement seems to imply that there is little suited topsoil for disturbed areas. Yet the Renohill, Terry, Satanta, and Ulm soils appear to have reasonably good suitability and cover a total of about 60% of the site. We do not want to discourage topsoiling by statements such as the last one when such suitability actually exists on much of the site.

We also note that the Bankard, Satanta, and Terry soils which occur on the site according to Figure 2, page IV-44, are not interpreted in Table 1, p. IV-43.

Volume IV, pages IV-66 to IV-69

States that plant communities have not been completely mapped. SCS range site descriptions and rangeland inventories are a possible source of vegetation information.

Volume IV, page IV-120

Third paragraph. The acreages that will be permanently lost from forage production is given as 240 or 740. This does not agree with page IV-108 that indicates 605 acres of vegetation will be permanently lost.

Volume IV, page V-126

SCS technical guides could be cited here on revegetation.

Volume IV, page VI-4

Last paragraph. Surface and coal ownership acreage figures given here do not agree with acreages discussed in succeeding sections.

Volume IV, page VI-89

Discussion does not make clear how much land will be permanently removed from grazing use.

Volume IV, page IV-99

Same comment as page I-627, Volume I.

Volume IV, page IV-148, para. 2, sentence 1

This statement is incorrect if topsoil is returned as per earlier assumptions.

Volume IV, page V-27

Same comment as for page III-31, para. 1, Volume III.

The deficiencies referred to above relative to the ARCO and Carter mines also apply to the discussions of soils for the Kerr-McGee and the Wyodak mines.

Volume IV, pages VI-122 and VI-127

On page VI-122 it states 1125 acre of vegetation will be permanently removed while on page VI-127 it states that 900 acres will be permanently removed from grazing. If this discrepancy is real, it should be explained.

DRAFT EIS - Eastern Powder River Coal Basin

VOLUME V

Volume V, page B-22

This bibliography lists five SCS documents. However, the two relating to revegetation of mine spoils are not cited in the narrative. If SCS information was used it should be cited at the appropriate places in the text.

COMMENTS ON

DRAFT ENVIRONMENTAL STATEMENT
FOR
DEVELOPMENT OF COAL RESOURCES IN THE EASTERN POWDER RIVER COAL
BASIN OF WYOMING

1. Page I-329, third paragraph: In the second sentence, the term ". . . large . . ." as a qualification for blackfooted ferret habitat, needs quantification.
2. Page I-347, fourth paragraph: Of the four upland game species listed, only one - the ring necked pheasant - is associated with private lands (and irrigated agriculture).
3. Page I-617, Although this section is listed as "SIGNIFICANT MITIGATING MEASURES," they are not listed. Why not include such general measures as:
 - a. Revegetate denuded areas as promptly as possible.
 - b. Withhold road construction (except at crossings) from drainage bottoms.
 - c. Bury toxic substances only on ridge tops or wherever a minimum of water will flow through and over them.
 - d. Provide sediment traps along road construction to retain sediment until revegetation becomes effective.
 - e. Avoid deposition of toxic or highly soluble substances in backfills which are to be at the same level as aquifers.
 - f. Restrict equipment use in stream bottoms.
4. Page I - 625, last sentence: It should read "Generally, no spoil or cut slope should . . ."
5. Page I-868: Are there adverse environmental impacts and, hence, mitigation measures needed at the destination of the coal slurry water?
6. Page II-131, first sentence of last paragraph: This should read, ". . . designated by BLM and Forest Service. . ."
7. Page II-138, change second paragraph to read ". . . or other structures which would permit satisfactory movement of wildlife."

8. Page III - 124: In the second sentence, eliminate ". . . with no slopes greater than 3:1." Such a decision has not been made in the ARCO lease.

Replace the first sentence of the second paragraph with "The final land form and use will be determined by the individuals or agencies with jurisdiction and responsibility for surface management." Eliminate the second sentence.

9. Pages III-127 and V-125: A potential adverse effect is the loss of well water supplies when de-watering for mining. The only mitigation measure mentioned is replacement with water from deeper wells. Is this the only one available?
10. Page III-138, paragraph 4: This sentence should read ". . . coordinated by the surface owner or agency administering surface values with the Wyoming Game and Fish Department."
11. Page V-122, second sentence: Omit ". . . with no slopes steeper than 3:1."
12. Page V-123: Soil information required of Kerr-McGee prior to mining is incompletely listed. It should include chemical analysis and otherwise be identical to that being required of the Atlantic Richfield Company (ARCO) Site in III-125.
13. Page V - Map 1: The colors in both the legend and on the map of the National Grasslands appear to be mixed up.

There are a number of obvious errors and inconsistencies in the maps. Greater care in their preparation can eliminate most of the problems - for example, on Map 9, surely the summer range for antelope is not limited (as shown) to less than a township in this study area of approximately 5 million acres.

14. Volume V, Page C-1, Item 1.b.(1): Change "minimize" to "mitigate."

Page i: Nothing in the Summary indicates that a reduction in water quality is expected, although the Statement, itself, expresses this important possibility in several places.

General Comments

The Companies should plan to provide sufficient underground hydrology data upon which to determine the feasibility of open water in places as a part of the final land form.

The Statement should suggest various alternative methods to State and local governments for accommodating the secondary impacts expected.

A discussion regarding the proper depth to which coal should be mined in order to minimize (or avoid) the impact of reopening the area sometime in the future, after current rehabilitation has been accomplished, is needed. An interesting aspect of this concern is shown on Page I-191, which states that uranium underlies some of the coal and that maybe the uranium could be mined at a profit - after rehabilitation of the area from coal mining?

Also needed, is a discussion of coal field (area-wide) preplanning and operations with respect to uniformity between many separate lease holds, separate surface ownerships, etc., so that the final result is in harmony with area-wide objectives rather than a patchwork of individual and unrelated operations.

Although we have many other review comments to offer, they are relatively less significant and will be transmitted by the Supervisor of the Medicine Bow National Forest, directly at the local level, to other members of the team preparing the Final.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

WO

REPLY TO: 8400 Environmental Statements

July 11, 1974

SUBJECT: Draft Environmental Statement on Eastern Powder
River Coal Basin of WyomingTO: John P. Butt
Acting Environmental Coordinator

The Wildlife Management Division has reviewed the Eastern Powder River Coal Basin Draft Environmental Statement.

Impacts to the wildlife and fish habitat resources as presented in the statement are unfortunately realistic. The project will have grave consequences on the integrity of these values over a long time span.

We feel that the project is in direct conflict with the Endangered Species Act of 1973 and therefore illegal in those areas where the habitat of an endangered species, such as the black-footed ferret, is to be altered.

EVERETT R. DOMAN
Director of Wildlife Management

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

WO

REPLY TO: 8400 Environmental Statements

July 15, 1974

SUBJECT: Draft Environmental Impact Statement - Regional Analysis
Development of Coal Resources in the Eastern Powder River
Basin of Wyoming

TO: John P. Butt, Acting Environmental Coordinator, P&PA

Per your June 10 request, here are our comments on the captioned report.

The Draft Environmental Statement is complete and well written (a few corrections are needed and are noted below).

The discussions concerning impacts on recreation, wildlife, and fish are quite good compared to other statements we have reviewed. More perspective is still needed.

Analysts need to report on the area that will be disturbed in relation to the size of the entire area, province or whatever. Attaining familiarity with actual mining projects should be a goal of all team members.

Suggested areas of improvement:

1. More clearly define the area to be disturbed in relation to the gross area. (Expressing the relative sizes in percent adds perspective.)
2. State the percentage of disturbed lands that will be in an unreclaimed status at any one time.
3. Rate of progression of operation and also rehabilitation should be clearly noted.
4. Are there factual data to support irreversible and irretrievable losses? What is meant by long term and short term? For example, in many western areas sage brush will eventually come back on abused land under some conditions. (One condition may be overgrazing and subsequently vacating the land.)
5. If wildlife losses are predicted, what percent of the total estimated population will the losses represent? Are the losses significant? Can they be replaced? If so, under what conditions?
6. Assuming the reclaimed area will not be suitable for a return of the same species, will the habitat be suitable for a new species? Will the reclaimed land eventually be of greater value, in any of the areas, than was the land before mining disturbance?

7. Destruction of wildlife from operations is probably overstated. Is loss of habitat from oil field development significant?


Some of the answers can be gleaned from the statement, but it is time-consuming and most readers can not establish by themselves, proper perspective.

Paragraph one, first sentence, page 2 of Preface. ". . . many of which may or may not require" How about ". . . many of which may require"

Second page of Preface. Any one of the lease approvals will constitute a major Federal action and one or more Federal agencies may be involved.

Second page of Preface, paragraph two, fifth and sixth sentence. Date National Environmental Policy Act was signed and became law on January 1, 1970.

Chapter I, page I-1, next to last sentence, bottom of page. Rights-of-way must be obtained from these agencies--not "filled."


HOWARD E. BANTA

Acting Director of Watershed Management

Enclosures

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

WO

REPLY TO: 8400 Environmental Statements

AUG 2 1974

SUBJECT: Draft Environmental Statement for the Development of Coal
Resources in the Eastern Powder River Coal Basin of Wyoming

TO: John Butt, P&PA



The subject draft environmental statement has been reviewed.

This is an exhaustive study which considers all of the environmental, ecological, social and economic aspects of strip mining the shallow coal reserves of the Eastern Powder River Basin. We believe it covers the alternative sources of electrical energy generation adequately and leads to the conclusion that coal is currently the only logical, economic and timely source of energy.

We recognize that there are alternative coal fields which will be assessed for environmental and public suitability.

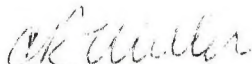
The difficulties in organizing and executing such a study appear monumental. The completion of this project to this stage, with an understandable document, is a major and significant accomplishment. The group that participated is to be commended.

There are a few items included in the report that could be rearranged or restated for clarity and better understanding. These are:

1. Page I-90 - Septic tanks and drain fields may not be adequate.
2. Page I-105 - Last paragraph should read "dense fill will not settle."
3. Page I-107 - Clinker must be carefully selected to assure durability under heavy loadings.
4. Page I-114 - There are very tight restrictions on burning dumps.
5. Page I-248 - 2d paragraph - an extra "are."
6. Page I-256 - We believe that "Recreation" is an appropriate use of reservoirs in Wyoming and should be listed.
7. Page I-266 - Include "Recreation" in listing.
8. Page I-452 - Will the town of Gillette be allowed to continue to supply public water that does not meet the standards?

9. Page I-516 - Are the consequences listed in the 2d paragraph unavoidable and uncontrollable?
10. Page I-762, I-763 - We believe a more appropriate word than "wilderness" can be used to describe the qualities. Currently "wilderness" carries connotations that are very restrictive and misleading.
11. Page II-127 - (2) spell "tracked"
12. Page II-129 - (9) First 2 sentences are inconsistent. Deep sloping cuts can cause problems of rehabilitation in certain formations. Slopes should be designed with the final treatment and conditions in mind.
13. Page II-139 - "Truck Trails" is a misleading and misunderstood description. We prefer "low standard road."
14. Page II-140 - The attempt to generalize in grazing administration and "authorized officer" could lead to confusion and misunderstanding. This is especially a problem in the administration of Federal lands under the various jurisdictions.
15. Page III-15 - We question that successful reseeding can be accomplished in a routine manner.
16. Page III-16 - 3d paragraph - Is the establishment of the pre-white man biological community desirable or possible.
17. Page III-18 - Burning dumps is a questionable practice.
18. Page C-1 - Has the job load created by this statement of objectives and procedures been quantified and programed?
19. Page D-44)- There is an apparent inconsistency in the assignment of
&) the appropriate office of the Forest Service regarding
Page D-60)- the stipulations.

We appreciate the opportunity to review and comment on this proposal and statement.


C. R. WELLER
Assistant Director
of Engineering



UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Washington, D. C. 20250



57

8400

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Sir:

In accordance with this Department's letter of August 7, we are forwarding the comments from the Economic Research Service. Also enclosed are comments from our Division of Engineering.

We believe the comment on solid waste disposal is particularly appropriate.

Sincerely,


Deputy Chief

Enclosures

57

UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE
WASHINGTON, D.C. 20250

August 2, 1974

SUBJECT: Review of Draft Environmental Statement for Development of
Coal Resources in the Eastern Powder River Coal Basin

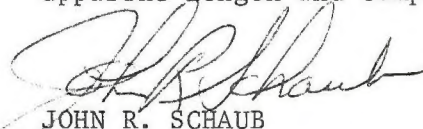
TO: Melvin E. Loveridge, F.S.

Robert Coltrane and Frank Osterhoudt have reviewed the Powder River Coal Basin Environmental Impact Statement. Unfortunately we did not have adequate time to fully evaluate the statement.

Both Coltrane and Osterhoudt feel there is a need for a detailed appraisal of the projections before the possible impacts suggested in the report are accepted. For example, the report contains population and employment projections made in a study conducted by the University of Wyoming. However, the Impact Statement does not contain all the projections or assumptions made by the University. In reading the statement it is not possible to determine whether the projections included are for specific situations for which the Environmental Statement is accountable.

Coltrane notes that the impact of coal development in the Powder River Basin on the organization and function of local governments is missing. The report does look at possible impacts on services local governments would have to provide, but it does not adequately address the elements of the decision-making processes, sources of funds etc. to meet the demand for increased services. For more detail on these points, please see Coltrane's review which is enclosed.

A general observation is that the report is long and appears to be comprehensive. However, there is some question whether the report adequately appraises the relevant options and alternatives. More detailed analysis is required, but this must be done by going back to source information. A reviewer should be cautioned against being lulled into a sense of complacency given the apparent length and comprehensiveness of the report.



JOHN R. SCHAUB

Leader, Agricultural Resource
and Environment
Natural Resource Economics Division

UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE
WASHINGTON, D.C. 20250

August 1, 1974

SUBJECT: Enviromental Impact Statement for the Eastern Powder River
Coal Basin of Wyoming--Socioeconomic conditions

TO: William C. Motes, Director
Economic Development Division

The statement includes discussion of the impacts of planned coal mining and related activities on many socioeconomic conditions in the Powder River Coal Basin. Impacts on population, age structure, schools, employment, agriculture, income, fire protection, water and sewerage facilities, social services, housing, health and medical services, and community attitudes and lifestyles are estimated and discussed. I did not attempt an analysis of the "accuracy" of either the estimated changes or the specific conclusions reached on the items covered.

There is one important socioeconomic-government category missing in the report. That is the impact changes in the Powder River Basin are likely to have on the organization and functions of the local governments. While it is necessary to address changes that are likely to have impacts on services the local governments provide, such as water and sewer, and fire protection, it is equally important to address changes that impact on the decisions local governments must make in attempting to provide the services. For example, changes in the size and socioeconomic composition of the population of Gillette, Wyoming, will confront local units of government with the need to make decisions pertaining to investment in public services and facilities. Some questions are, what are possible sources of investment capital for such expenditures? Should the local units of government be reorganized to best make the necessary decisions? Areas that change from an agricultural economy to an urban-industrial one often find it necessary to change the organization of their local government units. Finally, Wyoming is one of the few States that has not organized sub-state planning and development districts. The coal development in the Powder River Basin will have region-wide impacts. A multi-county organization could probably best handle many of the problems that will likely arise.

Robert Coltrane, Leader
Regional Analysis Program Area



UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230

58

August 9, 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P.O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

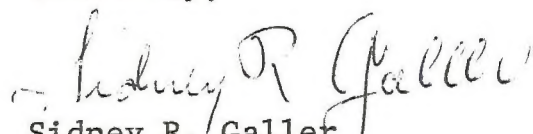
The draft environmental impact statement for Development of Coal Resources in the Eastern Powder River Coal Basin in Wyoming has been received by the Department of Commerce for review and comment.

The statement has been reviewed and the following comment is offered for your consideration.

Although repeated general statements are made with regard to the adverse impact on existing air conditions if the proposed development in the Eastern Powder River Basin is carried out, no quantitative assessment of the anticipated air quality is shown or referenced. Obviously, an increase in pollutant emissions will increase pollutant concentrations in the atmosphere. But whether or not these concentrations violate air quality standards cannot be answered unless measurements are made or the situation is assessed by applying appropriate atmospheric diffusion models.

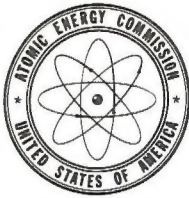
Thank you for giving us an opportunity to provide this comment, which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,


Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs



VII-928



59

UNITED STATES
ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

AUG 15 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
U. S. Department of Interior
P. O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

This is in response to your transmittal letter requesting the U. S. Atomic Energy Commission (AEC) to review an interagency draft environmental impact statement prepared by the Bureau of Land Management (BLM), the Geological Survey, the Forest Service, and the Interstate Commerce Commission on the development of coal resources in the Eastern Powder River Basin in Wyoming.

Our review of the statement indicates that the proposed action will not conflict with any projects under the jurisdiction of the AEC Director of Regulation. However, there may be a possible conflict with the planned AEC program on coal gasification which is under the auspices of the AEC General Manager. We wish to suggest that consideration be given to AEC in the selection of approximately 640 acres of land in the Basin, which is the projected requirement for a proposed in situ coal gasification project.

In the discussion of the future development of coal in the Eastern Powder River Basin through the year 2000 in Chapter I, only existing technologies are considered, including only those mines, power plants, and coal gasification plants which are proposed. We feel that possible impacts of new technologies, such as the in situ coal gasification should be presented, as well as a discussion of any possible impact of administrative or legislative constraints. Specific staff comments which relate to the AEC in situ coal gasification program are presented in the enclosed staff report.

The discussion of nuclear power (I-806) should be updated. Information relating to the current resource base presented in the April 1973 AEC publication, WASH-1243, entitled "Nuclear Fuel Resources and Requirements" should be used. This publication can be obtained from the AEC if a copy is not already available. The data presented in Figure 10 of this publication is recommended for use in presenting the current production and reserve potential of U_3O_8 .

Mr. Daniel P. Baker

- 2 -

The AEC publication entitled "Nuclear Power Growth, 1974-2000" has been updated (WASH-1139(74)). Table 1 of this report shows the current estimate of the ranges of nuclear capacity within the United States to be somewhat lower than as presented on page I-811. The current estimates for installed nuclear capacity for the years 1980, 1985, 1990, and 2000 are given in the enclosed staff report. As of June 30, 1974, the installed nuclear capacity within the United States was approximately 28,000 MW.

The status of the three fuel reprocessing plants (I-814) has changed. Of the two already constructed, neither is currently operating. The Nuclear Fuels Service plant, which had been operating, has been closed for modification to meet current AEC regulations. The General Electric Company, who has built the other, has recently reported to the AEC that it does not want to commit the Midwest Fuel Recovery Plant to radioactively hot operations. Therefore, this plant should be at least for the present excluded from any statistics regarding commercial fuel reprocessing plants. The third plant, Barnwell, is currently under construction and the application for the operating license is currently under review by the AEC Director of Regulation.

We have no comments on the discussion of nuclear stimulation (page I-766); however, we should like to point out that there has been an addendum to the Rio Blanco Environmental Statement (WASH-1519 addendum) which was published in March 1973. We suggest that this be included in your consideration of the nuclear stimulation section.

The statement could be improved if appropriate notations were made within the text when reference material is used. Additionally, it would be helpful if the references for each chapter were placed at the end of each chapter rather than to group them together in the appendix.

In general, we feel that the statement is quite complete and is well documented with respect to the assessment of the fish and wildlife resources of the region. The range maps and other documentation in the

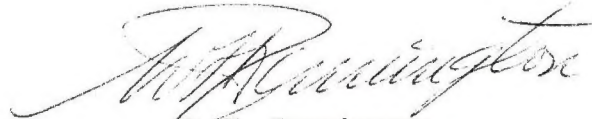
Mr. Daniel P. Baker

- 3 -

appendices are considered to be excellent and appear to reflect the input of considerable professional wildlife and environmental expertise. However, some specific comments are provided in the enclosed staff report for your additional consideration in the preparation of the final statement.

We appreciate the opportunity to comment on the draft statement.

Sincerely,



W. H. Pennington
Assessments and Coordination
Officer
Division of Biomedical and
Environmental Research

Enclosure:
Staff Report

cc: Council on Environmental Quality (5)

STAFF REPORT

Comments on the Bureau of Land Management
Draft Environmental Impact Statement
on the
Development of Coal Resources in the
Eastern Powder River Coal Basin of Wyoming

I. In situ coal gasification program:

- p. 1-22 Mention in situ recovery together with underground mining.
- p. 1-28 In situ potential development should be discussed.
- p. 1-33 Discussion of technological trends should include in situ gasification with respect to its potentially lower environmental impact than those from other recovery methods.
- p. 1-40,41 Possibility of future in situ gasification industrial development should be treated.
- p. 1-48-50 Pipeline requirements resulting from in situ development should be indicated.
- p. 1-52 Water requirements for in situ should be given here.
- p. 1-56-60 Projected in situ gasification plants in this region should be mentioned. Certainly, the assumptions presented here would be markedly different if in situ gasification technology is used extensively in this region.
- p. 1-94 In situ work carried out by the Bureau of Mines in Hanna, Wyoming is mentioned here. This would be a good place for a discussion of the AEC in situ process and its potential for developing the deep, thick coal sequences in this area. Development time scale should be indicated.
- p. 1-111 Process waste discussion should mention advantages of in situ process.
- p. 1-459-
611 Chapter V ("Probable Cumulative Regional Impacts") should discuss in situ coal gasification and the extent of the possible impacts of this technology in the region. On p. 1-459-460 the projected 1990 development would surely be different if in situ technology were aggressively pursued.
- p. 1-612-
646 Chapter VI ("Significant Mitigating Measures") should include measures needed to mitigate effects of in situ technology.

- p. 1-647- Chapter VII ("Probable Adverse Environmental Effects which
668 Cannot be Avoided") should indicate how these will change if
in situ technology is used.
- p. 1-683- This discussion of in situ technology should include the AEC
684 Program. This would be a good place for a reasonably detailed
discussion of the process.
- p. 1-859- Both Chapters IX and X should include the effect of in situ
874 technology on the development of this coal region.

II. Environmental Consideration - General Comments

1. Figure 7, page I-524 is an example of interesting but largely undocumented material. The assumptions and figures upon which this figure is based are nowhere clearly defined although taken by itself, the figure presents a fairly good projection for wildlife groups "2" and "3." There is no contention that this figure is not an accurate assessment. However, there is not sufficient documentation or background material presented to determine the validity of the assumptions upon which it is based.
2. In general, the assessments of the impacts upon wildlife seem reasonably accurate, although even "ball park" estimates may be more accurate than can be justified at this stage with the material available upon which to base assessments of this nature. Nevertheless, the statement leaves little doubt that there will be tremendously significant and detrimental losses both to wildlife and wildlife habitat as a result of the proposed action. This potential adverse impact then leads to what may be a serious omission of the statement. This concerns the fact that the discussion of the proposed alternatives of nuclear power, etc. (page I-806 and following), makes no mention of the comparative environmental costs and destruction of wildlife and wildlife habitat which would result from the use of nuclear instead of coal power to produce the needed electric power. We feel that if such a "side-by-side" comparison of environmental costs were made, nuclear power in the long run would be less destructive. The destructive local effects of excess hot water (page I-812) is pointed out but it is not pointed out that nuclear reactors in situ at the points where electrical power is needed would result in no destruction of either wildlife or wildlife habitat in the Powder River Coal Basin.
3. On page I-816, it is stated that, "The leadtime for the construction of such additional (nuclear generating) capacity . . . approaches a decade and, therefore, is not an alternative to extracting federally-owned coal from the Eastern Powder River Coal Basin of Wyoming." The length of time it would take Nuclear Power to come "on line" does not limit

it as an alternative to the mining of Powder River Basin coal. The alternatives that could be considered are: (1) mine federal coal now in the Powder River Basin and effect the predicted destruction of wildlife and wildlife habitat or (2) take the necessary measures now to either reduce national energy demands or use alternative energy resources as "stop gap" measures, until nuclear power can come on line and indeed fill the energy demands described without the destruction of Powder River Basin habitat or wildlife. The impact statement seems to be premised on the fact that it is "given" that abundant energy of some form must be made immediately available. The section on "Energy Conservation" (page I-829 and following) is well written and fairly complete. The import of this section should have been considered in the writing of the statements on page I-816.

4. This reviewer did not feel competent to review all the other alternative energy resources listed by this statement. However, it was felt that the treatment of the nuclear power alternative, particularly the treatment accorded the wildlife and environmental cost of nuclear power, leads one to believe that the statement does not fully present the environmental costs of alternative energy resources, as opposed to the comparable environmental costs documented for the Powder River Basin coal extraction.

An example of the lack of treatment of the environmental costs of alternative energy resources occurs on pages I-818-819. Here the really infinitesimal destruction of wildlife habitat which would result from a geothermal installation is described in great detail; however, no mention is made of the fact that the habitat destroyed would in no way compare with that documented for the proposed Powder River Coal Basin Activity (see Chapters V, VII and X). Furthermore, solar energy, a presently recognized alternative energy resource in many parts of the world is not even mentioned in this statement. This is an omission which should be corrected before the statement is finalized. In describing the alternative of solar energy, "side-by-side" appraisal of the total environmental costs of each alternative should be made as mentioned above for nuclear and geothermal energy resources.

* * * *

Specific Comments

5. Page I-808 - The first paragraph starting with "Reserves . . ." should be updated using the previously mentioned AEC publication, WASH-1243.

6. Page I-810 - Table 15 has "Land" category missing and its cost of one million dollars.
7. Page I-811 - Installed nuclear capacity as of June 30, 1974 is about 28,000 MW. The revised AEC estimate (Feb. 1974) for installed nuclear capacity is now 85,000-112,000 MW by 1980, 231,000-275,000 MW by 1985, 410,000-575,000 MW by 1990 and 850,000-1,400,000 MW by the year 2000.
8. Page I-812 - Line 18 should read "As of January 1, 1973, 55% of the uranium production came from . . . mines."



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DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

August 12, 1974

Mr. Daniel P. Baker
State Director
Bureau of Land Management
P.O. Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

Please refer to our letter to you of August 7 which transmitted comments from this Department on the Draft Environmental Statement for the Eastern Powder River Coal Basin in Wyoming.

Enclosed are some additional comments from the Soil Conservation Service which arrived too late to be included with our earlier letter.

We hope these comments can still be considered by the Bureau of Land Management.

Sincerely,

DAVID J. WARD
Acting Coordinator
Environmental Quality Activities

Enclosure

EASTERN POWDER RIVER COAL BASIN DRAFT ENVIRONMENTAL STATEMENT

GENERAL COMMENTS

The general statements on impact on soils appear fairly accurate; however, some of the assumptions made may be questionable (see our detailed comments). There is a considerable amount of grammatical or typographical errors.

As indicated in comments for each of the mine sites, they are requiring soil inventories both before and after mining. However, they are to meet standards set by the FS or BLM. No mention is made to the effect that the soils be classified to meet requirements of an SCS standard soil survey and the comprehensive soil classification system. No mention is made as to what the standards of either FS or BLM are.

They outline specific requirements for information based on lab analyses. Without a soil survey that classifies soils, such data can only refer to specific borings and cannot be applied to all areas of a soil series. This is indicated in several places as mentioned in specific comments.

In each vegetative section, no reference is made to potential vegetation as compared to what vegetation is presently there. This should also be recognized in the revegetation sections.

Page numbering should be consistent so items can be followed better. Volume I has Part I, Chapters I-IV; however, Volume III has parts II and III, etc. Perhaps it would have been more clear if parts had been identified by letter instead, similar to the method used in Volume V.

VOLUME I

P.I-59, item 6, second year. We don't believe it is practical to let spoil lay a year before seeding. It would have to be cultivated to keep weeds down. Erosion could become a serious problem. One of the two following alternatives would be better:

1. Seed grass and mulch with two tons prairie grass hay or straw after spreading topsoil.
2. Seed sorghum after the topsoil is spread. Seed into sorghum stubble following late fall or early spring.

P. I-59, item 7. We question that production will be decreased by 50%. What is the basis for this statement?

P. I61. Using the term "topsoil" to describe part of the soil profile is confusing. Topsoil is generally defined as soil material that will support plant growth used to cover other material. (Check with soil scientists.) "Soil materials" might be preferable. In some instances material from below the surface may provide a better growing media.

P. I-79. Why only 78-80% of the mined lands would be expected to be successfully rehabilitated? What does "suitable ecological conditions" mean?

Pp. I-144 & I-145. Reference is made to the use of our county general soil maps in preparing the soil association map and indicating an element of questionable accuracy because of trying to correlate information dating back to 1953 with modern classification concepts. We have no quarrel with their statement but it was their decision to use this piecemeal data. We can supply a much better map and data about soil composition in map units from our recent irrigable soil map.

P. I-268. Why the dramatic discussion of big sagebrush? There are many significant plants in this area which can be discussed from an ecological standpoint.

Overgrazing by bison was near water and not on the whole prairie per se. Many large areas miles from water were relatively ungrazed or used as winter areas when snow could be utilized for water.

Vegetation can be manipulated by different kinds of grazing of browsing animals depending on how it is utilized.

P. I-269. The vegetative types and subtypes are a misnomer. For instance, under big sagebrush type big sagebrush is not the dominant species on the 4,188,000 acres for this type. Big sagebrush will make up less than 20 percent of the specie composition with grasses making up about 60% and forbs and annuals the rest. The density of any species can vary on a specific area within these 4,188,000 acres depending on soils, grazing use, fire, etc.

P. I-273. The statement on plains pricklypear cactus is very misleading. Cactus does increase due to overuse of rangelands, but drought years can accelerate this process.

P. I-371, last sentence on page. How is winter forage a critical limiting factor in this area?

P. I-374, third sentence from top. Sheep do not predominate in the south, but this area has more ranches which run cattle and sheep together.

VOLUME II

P. I-475. Statement that a mixing of overburdens may result in surface concentrations of some elements such as boron that may be toxic to plant growth should include the fact that no toxic concentrations have been found to date in mining that has occurred or in core drilling done to date.

Pp. I-475-577. Most of what is said is true concerning the impact of soils by strip mining. However, the way some statements are written leaves us cold. Example, sentence near the bottom of page 475: "Could result..." "May be toxic..." Conversely, on page 651, the destruction or/and change of soils in the strip mining process is discussed as being all on the bad or negative side. Actually, some soil characteristics of some soils in the area could be enhanced by mixing actions. This also applies to page 862.

P. I-490. "Well in each 40 acre tract would assure a yield of 2,000 GPM each." This statement appears too optimistic even at the depth indicated.

P. I-495 (bottom) and I-496 (top). Conjecture that land surface subsidence might occur if artesian water heads were lowered is so remote a possibility that this should probably be so indicated.

P. I-495 (last paragraph) needs to be clarified, especially the (1) expansion of water. It is doubtful that enough water could ever be pumped from the consolidated shales to result in measurable subsidence since water won't move through the formation fast enough.

I. I-631. In the beginning of Vol. I, the grasslands of this area are described as short grass plains. On this page a switch is made and now it is called a mixed grass prairie. Ecologists describe this area both ways, depending on the ecologist. The grass species in excellent condition do show this region to be mixed grass prairie. Whichever way the writers classify this area, they should remain consistent.

VOLUME III

II-33. Next to last paragraph, what does "Where it is practical" mean?

II-34, paragraph 3. Early spring seeding is o.k., too, before April 1. Last paragraph, scratch "brillion seeder" as it is a very poor piece of equipment for this type of seeding. Say: "with single or double discs."

II-114 through 117. Looks like someone got carried away. Information is very hypothetical.

II-115, middle of page. It seems there is much less than 10% irrigated land in the vicinity of the railroad. This "less than ten percent" may be misleading.

III-15. Recommend 1 lb. of four-wing saltbush be included to increase forbs in the mixture. Seed is available from the SCS Plant Materials Center at Bridger, Montana.

III-68. Fourth sentence in first paragraph is not correct. There is considerable evidence to show the ecological niche for big sagebrush. It is a part of the plant community but should not be the dominant vegetative species. The last paragraph on this page is very misleading. Big sagebrush is not considered an invader into these grasslands.

III-125. ARCO lease requires that the Forest Service be furnished detailed soils information and map to standards designated by the Forest Service. How do FS standards compare with National Cooperative Soil Survey?

VOLUME IV

IV-121. The last sentence may not be true. We feel mined land can be returned to cropland use if it is desired.

IV-127. Carter lease - BLM sets standards for soil inventories. How do BLM standards compare to FS or National Cooperative Soil Survey?

IV-169, last paragraph. We believe that the idea that whether or not the area ever obtains its present productive capacity will depend on resource management of lands after the operation is over. It could be fertilized, rocks removed, water spreading, conservation practices installed.

V-123. Kerr-McGee to provide Forest Service with soil map and information. See comment III-125.

V-109. What toxic material? State law calls for all toxic and non-productive material to be covered.

VI-7. Coal production required by year. Shouldn't heading over tons per year be "tons," not "million tons?"

VI-90. "...lost permanently to crop production." Not necessarily so. We feel mined land can be returned to cropland use if it is desired.

VI-95. Wyodak-BLM to set standards. See comment IV-127.

VOLUME V

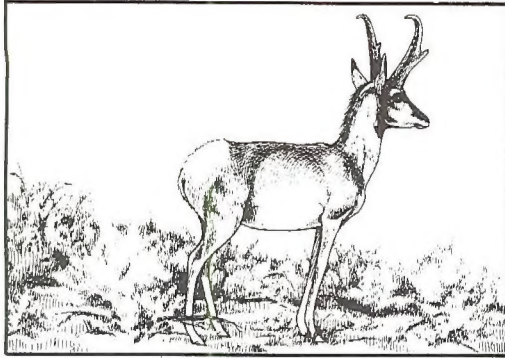
Appendices 1 - Map 1. We thought the land in the Thunder Basin National Grasslands was privately owned except for the old L.U. lands. This map leads one to believe it is owned by the Forest Service.

Pp. C-42 & C-43. Proper management is an important part of mine reclamation and any other grass use. Can we assume that the reclaimed lands will have poor management?

We feel the study of abandoned farmland by Dr. Lang needs further interpretation. Ground cover isn't the only measure of range production. How about total yield and carrying capacity?

Figure 7 and Table 11 seem to be misnumbered or something.

C-43. We don't think they can support observations made on this page. Management after vegetative establishment will dictate what trend vegetation will take, be it deterioration or improvement. There is no basis for the "50 percent less productivity" statement.



Sierra Club NORTHERN GREAT PLAINS OFFICE
 Post Office Box 721, Dubois, Wyoming 82513

26 August 1974

Daniel Baker
 State Director
 Bureau of Land Management
 Box 1828
 Cheyenne, Wyoming 82001

Dear Dan:

Recent investigation and discussions with area residents have brought to light a few alternatives which were not discussed in the draft Powder River environmental impact statement. Although the comment period has passed, we are writing to state these alternatives and ask that they be considered. We do not endorse any of these suggestions at this time, but they would receive our attention if fuller analysis could be given.

1. The railroad grade as described in the impact statement is unique. Statndard railroad design does not have to meet such a restrictive gradient. Using this restriction will create excessive cuts and fills and a rather impenetrable barrier. The impact statement should consider a less restrictive grade and go into a great deal of discussion on access problems.

2. The railroad route would not necessarily have to go all the way from Gillette to Douglas. In the event that mines should open south of the present AMAX mine, the line could go to the mines and then back to Gillette.

3. More thorough consideration should be given to the alternative of slurry pipelines.

Sincerely,

Laney

Ms. Laney Hicks
 Northern Plains Representative

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FEDERAL ENERGY ADMINISTRATION

WASHINGTON, D.C. 20461

AUG 26 1974

OFFICE OF THE ADMINISTRATOR

Mr. Daniel P. Baker
State Director
Bureau of Land Management
U.S. Department of Interior
Post Office Box 1828
Cheyenne, Wyoming 82001

Dear Mr. Baker:

The Federal Energy Administration has reviewed the Draft Environmental Impact Statement pertaining to Development of Coal Resources in the Eastern Powder River Basin of Wyoming.

Of major concern is the omission of an analysis regarding the national and international significance of the proposed projects. The coal resources of this basin are low in sulfur content, readily accessible, expeditiously mineable and low in cost; therefore, they are of critical importance to this Nation's future. The E.I.S. should be expanded to include a full discussion of the following factors:

1. The Federal coal resources of the Powder River Basin are recognized as one of the most significant coal reserves that can be developed within a reasonably short time.
2. The expeditious development of these reserves will help provide the Nation with a long-term, stable, economic fuel base which will not only help stabilize the domestic coal market and lower the cost of power to the American taxpayer, but also will allow critically needed reserves of domestic oil and gas to be utilized for uses that coal cannot fulfill.
3. These low sulphur fuel resources will in many applications negate the need for power plants to install the unproven, extremely costly stack gas scrubbers with their attendant land and water impact.
4. The development of these resources will offset and reduce the importation and utilization of high-cost, uncertain foreign supplies, thus reducing the world-wide inflationary spiral of energy costs.

In general, we feel that the report glosses over, rather lightly, the positive environmental benefits which could accrue from development of coal resources of the subject coal basin.

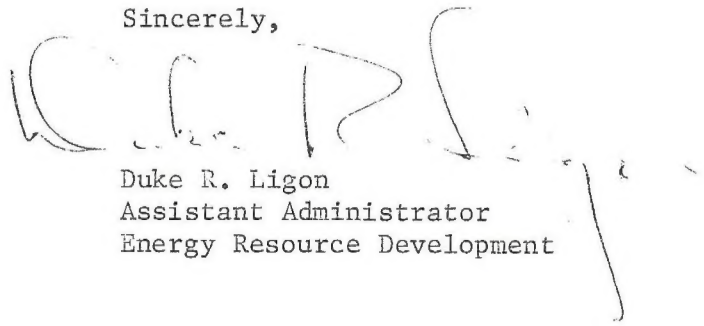
The historical, game, and other recreational aspects of the coal basin are important and worthy of protection. However, temporary loss of small portions of the range (surface) from year to year over a period of 50 to 100 years would not appear to create unacceptable disruptions, since reclamation and restoration of the stripped land would follow development closely. Less than .05% of the total land area would be subject to environmental dislocation at any one time, and probably less than .1% would be affected during any two or three-year period. With careful Federal and state management, the natural values of the area can be preserved while stripping operations are in progress. It is not beyond the bounds of reality to assume that intensive reclamation and revegetation could result in enhancement of habitat.

Terrestrial features in proximate location to mine facilities could be improved, after stripping, by scientifically planned shaping, revegetation and proper drainage, to minimize erosion and sediment runoff. The same kind of planning could be used to protect water supply sources.

Apparently, the subject report was written to emphasize only the effects of strip mining that could cause a negative impact on the life and life styles in the Eastern Powder River Basin. Such one-sided reporting is unfortunate because it distracts seriously from an otherwise fairly complete report and may tend to cause delays in mining these valuable coal resources.

In view of the above comments and the enclosed listing of specific errors and omissions, we recommend that the statement be revised.

Sincerely,

A large, stylized handwritten signature in dark ink, appearing to read 'D. R. Ligon', is written over the typed name and title.

Duke R. Ligon
Assistant Administrator
Energy Resource Development

Enclosure

SUMMARY SHEET

Page i Paragraph 3

Summaries are incomplete and the location of summary discussions in the text are not given.

As an example, in Page i-1, Paragraph 3, Item G, it is more accurate to say: There are no known archeological or paleontological values to be destroyed or impacted.

Page i-2

We note that the companies whose proposed projects have been analyzed are omitted. Also omitted are the companies or utilities who will be using the resources.

PREFACE - VOLUME I

Paragraph 4

Strike the "BLM" or "FS" reference to authorization because neither the Bureau of Land Management (BLM) or Forest Service (FS) authorizes occupancy for mining. The authorization is through the issuance of the mining permit by the U. S. Geological Survey (USGS) with the concurrence of the BLM or the FS.

CHAPTER I

Page I-1 We note that there are no figures for railroads, power plants, gas plants and mines. This information would be helpful.

Page I-6 Show totals of all expansions and new mines, railroad, power and gassification plants.

Page I-8 The Undersecretary in instructions issued in 1973 partially withdrew from the State Directors of BLM, and the Director of BLM, discretionary coal leasing authority. New leases can only be signed after review and concurrence by the Secretary.

Paragraph 3

USGS also supervises exploration operations conducted under prospecting permits.

Page I-9 Line 2

Change "team" to "train".

Since the Classification Act has expired the BLM does not classify the lands.

Paragraph 1, last sentence

The report should be specific as to what kind of compliance examination. Change "license land" to "lease lands".

Paragraph 2

You may want to simplify this paragraph by not repeating the phrase "all Federal lands".

Paragraph 3

Should come after Paragraph 1, I-10.

Page I-10 USGS authorizes and issues the mining permit. They also collect the royalties and/or lease rentals after the fifth year of lease issuances - they determine the royalty rates and are the only official Federal agency representing the Secretary in dealing with the lessee's after lease issuance.

The USGS makes the official classification as to whether or not the lands are to be leased competitively (KCLA - Known Coal Leasing Area) or whether the lands should be explored under a Prospecting Permit system that allows a Preference Right Lease.

The Prospecting Permit system is being held in abeyance pending further study and analysis by the Department of Interior.

Page I-11 The permit for inland navigable waters comes from the Corps of Engineers.

Omit last paragraph -- apparently irrelevant.

Page I-14 Paragraph 2

An explanation of why the minerals were reserved would be helpful.

Page I-15 Paragraph 2

At the end of this paragraph add: "However, this practice of condemnation is common to all States."

Page I-17 The Johnston Mine, west of Douglas, is a third mining center which is not analyzed in the report. It would help this report considerably if an analysis of the reclamation methods used at the Johnston Mine were included in Paragraph 2.

Page I-19 Figure 3
Show Glenrock and Arvada - mentioned in Page I-16.

Page I-28 These figures differ from the assumed totals of fourteen mines, two gas plants, etc.

Page I-30 Figure 3
The tonnage is off by 10^3 .

Page I-32 Line 1
Figure 3 indicates a 7% annual increase from 1983 to 1990 while the text states a modest rate of 2% to 3% was projected. The projections should fit Figure 3 - contrary to I-32, they are not within either the most probable or extensive forecasts shown in Table 2. It would be better to graph Table 2 on Figure 3.

Page I-33 The demand also reflects to a large extent the effect of the Clean Air Act. SO_2 stack scrubbers have not been proven commercially successful. On July 1, 1975 industry must have a source of clean low sulfur coal or make a commitment to install scrubbers. Another factor favoring development of western coal reserves is the tremendous advantage in mining costs. Also, to some extent, technology has indicated that low sulfur midwestern and eastern coals would create sludge problems which could cause surface and subsurface water and disposal problems.

A very significant factor in favor of expanding western stripping is the Mine, Health and Safety Act which has resulted in lowering underground productivity by 25%. The strip mines are a much safer operation with black lung being unknown and accidents significantly lower.

Page I-35 Paragraph 1 could be expanded to include the following:

The mine is producing 3 MM tons per year with 50 employees. The pit occupies about 40 acres with production from the 70' coal seam. The two coal tipples and the offices occupy only 30 acres. Reclamation can be done in sequence with mining so that at 10,000,000 TPY the total disturbed area will never exceed 200 acres - including the pit, overburden removal area, reclamation area, coal tipples, offices and shops.

Page I-39 Of the 864 acres disturbed at the Dave Johnston operation, from 1958 to 1973, 508 are at the mine site. The remainder is being utilized in the railroad and the adjoining road, which are 16 miles in length, and at the power plant. Of the 508 acres at the mine, over 400 acres have been reclaimed with excellent results. Leveling of the tailings started in 1965 and the area was replanted beginning in 1968. Various techniques have been tried, including borrow of topsoil from adjoining land. The borrow material results in rapid re-establishment of native vegetation with very little loss in vegetation regeneration from the borrow area. A large portion of the 100 acres currently disturbed consists of a man-made lake (or impoundment) with safe access for the many deer, antelope and cattle which are currently utilizing the pit because their water sources are scarce. The north pit will remain available as a water source for a number of years as the company is expanding the south pit to handle the mining operation.

At maximum planned production, only 20 acres of land per year will be disturbed at any one time. The extensive experiments, by the company on re-establishing native grasses, has shown it can reclaim over 95% of the area within two years of planting. This mine, railroad, road and power plant will have a maximum of about 400 acres out of production or less than 20 animal units per year.

The 750 megawatt Dave Johnston power plant, at present, occupies about 320 acres which includes ponds, coal pile, ash dump, buildings and parking areas. This acreage will be reduced to about 200 acres when the ash dump is backfilled

Page I-39 Continued

into the mines - thus, the maximum acreage to figure should be 200 and not 1000 as indicated.

The right of way for the transmission line might be 23 acres per mile, however the actual acreage use will be less than 10% of this or 2 acres per mile.

This 750 megawatt generating plant employs 180, which will give a figure of 120 for a 500 megawatt unit.

Page I-44 Based on the information portrayed in this paragraph, there appears to be an important omission in Table 45 of Volume 5, page C-94. Table 45 shows a projection for all employment sectors through 1990. However, light industries, sales and service growth, which constitute a significant enterprise does not appear in Table 45.

Page I-50 Paragraph 3

The 130 mile pipeline would disturb a strip about eight feet wide which would amount to one acre per mile or 130 acres.

Page I-51 A 100' R/W will require about 13 acres per mile, however the surface disturbance will be less than 1/10 of this or 1.3 acres per mile, thus the 153 miles of line to Buffalo and Spearfish will occupy only 200 acres. The 120 mile Pacific Power and Light line will disturb about 160 acres. additional 145 miles of line, to serve the two power plants, will disturb less than 200 acres. The total surface use and disturbance will be about 560 acres not the 4,000 to 5,000 as indicated.

Page I-54 Paragraph 2

The slurry pipeline is proposed - thus it may be in operation and may require 15,000 acre-feet.

A table showing water availability with a summary of uses and surplus would be very meaningful and may change the 3F summary on page i.

Page I-54 Continued

A recent Interior study (Rocky Mountain News, June 8, 1974) reports there is a surplus of water available in Wyoming beyond projected needs.

Page I-56 The Table should show the population increase for the two power plants and three mines indicated in the base. The population increase appears exaggerated (please see comment I-566).

For an additional outlook on population trends in this area see the following report:

Potential Future Role of Shale Oil
Prospects and Constraints
Prepared by Interagency Oil Shale Task Force
June 3, 1974 - page 207 to 230

Page I-57 The acreage figures appear exaggerated - the 750 megawatt Johnston Power Plant occupies about 200 acres, thus the acreage should be .27 acres per megawatt, not 2 acres.

The acreage for each mine will not exceed 100 acres (30 acres at the Belle Ayr Mine and about 20 acres at the Dave Johnston Mine). The slurry pipeline will disturb a width of 10 feet, or 1.2 acre/mile.

The powerline will utilize 1.3 acre/mile.

The roads (western open grazing) will utilize about 2.6 acre/mile.

Page I-58 The Table on top of page appears to be a duplication of Table 5, page I-53. The cumulative disturbed and reclaimed acreages appear extremely exaggerated. Use 100 acres per year/mine x two year delay.

The rest of this Table should be broken down to show total roads, powerlines, pipeline and railroad mileage figures - as indicated your acreage requirements for these R/W's are off by a factor of about ten and the power plant acreages are off by a factor of five.

Page I-58 Continued

The total removed will be about 6,200 acres not 9,514 whereas the 1990 unreclaimed would be about 3,000 acres as opposed to the 17,000 acres indicated.

Page I-59 Many of these guidelines may be unrealistic.

- #4 The five year time lag is not realistic. AMAX and Pacific Power and Light Company have demonstrated that a two year time lag is more realistic.

We suggest that the report include a chart showing:

1. The name of existing mining operations in the Wyoming Powder River Basin.
2. The acreage mined to date for each mine.
3. The acreage undergoing reclamation for each mine.
4. Acreage reclaimed to date for each mine.

A similar table should be prepared for the proposed mines as follows:

1. The name of the proposed mine with planned tonnage per year (1975-1990).
2. The acreage planned for each mine's facilities.
3. The acreage to be mined each year for each proposed mine.
4. The acreage planned for reclamation each year for each proposed mine.

- #6 Based on personal conversation with officials of AMAX and the Pacific Power and Light Company, their reclamation schedule is as follows:

1st year - reshaping - fertilizing and seeding

Page I-59

#6 Continued

2nd year - establish growth

3rd year - grazing

#7 There may be no loss - Even the N.A.S. shows a minimum of 80% reclamation which may make the lands more productive than they are now. Also refer to paragraph 1, I-662.

Page I-60 This chart should be corrected to reflect the corrected table on page I-57 titled "Acreage Requirements Used To Analyze Impacts".

Page I-62 Paragraph 3

AMAX at their Belle Ayr Mine, has in conjunction with the University of Wyoming, demonstrated that the deeper soils below the topsoil zone will support excellent vegetation with an apparent 95% to 97% success ration.

Page I-67 Figure 3

The location of the dragline in this Figure indicates poor mining practice.

Page I-79 Paragraph 1 and 2

The E.I.S. should analyze the reclamation studies and projects at the Dave Johnston and Belle Ayr Mines.

Paragraph 3

There should be no failures as this is not a recreation area and overgrazing should not take place with the few domestic animals in the area.

Page I-84 For purposes of comparison, show a picture with native growth.

Page I-109 Paragraph 3

On the western plains, access roads for power lines are not constructed. Generally, there is no cutting or filling or even grading.

Page I-116 Table 1

Confusing - add vertical lines to connect headings to proper column.

Page I-119 Paragraph 1

Table 1 shows the critical months. April, May and June had the highest number of days with precipitation of over one inch - 5, 6, 6 and 3, 6, 5 days for the two areas. This Table data does not agree with the statement in Paragraph 1.

Page I-129 Paragraph 3

Tell whether or not any of the existing power plants have caused air pollution during the inversion mentioned. Quantify.

Page I-131 Paragraph 3

What does this 13 to 21 Ug/M^3 mean?

Page I-134, 135 and 136

You mention the Dave Johnston Power Plant as creating air pollution problems, however, you do not point out why the #4 stack is in full compliance with all standards. This stack has a wet scrubber on it that is very successful in removing fly ash. Sulfur removal is not required because the coal is low sulfur which meets the primary standards. Why not mention also that the company, Pacific Power and Light, is going to install scrubbers on all the stacks and thus eliminate the problems. Why no analysis for the stacks at the Simpson Station?

Page I-137 A topographic map showing more detail than the map on page I-138 would be helpful here and in the appendix.

Page I-143 Line 1 Define geological erosion.

Page I-144 (top of page)

The mining is done on flat benches which will reduce the erosion potential from areas where the vegetation has been removed. Also, the spoil areas will have a low compaction factor which will increase infiltration and permeability rates thus increasing the success rate for revegetation.

Page I-144 Continued

The areas mentioned in Paragraph 1 and 2 might be restored to a much higher productive capacity than originally.

Page I-148 At the end of Paragraph 1 add a sentence, "However, the Bankard soil series is fairly suitable for final cover for mined land.

Page I-150 The Renohill soils have a fair suitability for surface soils as shown in Table 8, but on Page I-150 they are shown to have low productivity.

The suitability for soil surface cover as narrated on Pages I-148 through I-155 do not agree with Table 8.

Page I-156 The Btu equivalent for coal is off by a factor of 10 - it should be:

$$212,420 \times 10^{12}$$

The Btu equivalent for the gas is off by a factor of 100, it should read:

$$.52 \times 10^{12}$$

Page I-172 Paragraph 1

Sentence on multiple coal beds is confusing.

Page I-279 Locate the town of Gillette and outline the coal basin on this figure.

Page I-310 It would be appropriate to state that the eight historic sites would not be disturbed by any of the proposed operations.

Page I-312 to I-319

None of the features described have any bearings on aesthetics within the area to be mined.

Page I-312 to I-368

A section is needed on the specific portions of the basin to be affected.

- Page I-379 Table 42 and the remarks in Paragraph 1, 2, and 3 on Page I-379 are in conflict with the statement in Paragraph 4, Page I-379 - "Demand for irrigation water exceed the supply". The apparent conflict is based on information noted in Table 42. Table 42 notes that the ideal acre-feet of consumptive use in northeast Wyoming is 230,830 acre-feet of water; whereas, the North Platte River alone supplies 580,100 acre-feet. This indicates an excess of supply over demand of 249,278 acre-feet from the North Platte River as opposed to an indicated shortage of 72,480 acre-feet of water. It appears necessary to explain these discrepancies.
- Page I-384 If a detailed description of the power line was included in this E.I.S., an analysis and E.I.S. would not be required for power lines at a future date.
- Page I-388 Paragraph 1 Expand - Federal mineral estate including the minerals underlying some private surface lands. U. S. Geological Survey has supervisory control over all leaseable Federal mineral developments.
- Paragraph 2 Management policy has been extended by 43 CFR Part 23 much more than by NEPA. If the subsurface estate is private or state owned there are no Federal regulations governing their management. However, state regulations do apply to Federal mineral developments.
- Page I-389 As indicated above, State law and control does apply in many instances to Federal properties.
- Page I-391 In the summary a problem is alluded to - there may or may not be a problem at the state and local level. It would be better to outline how the problem is being handled than to leave the impression that nothing is being done. However, we suggest the last sentence of the last paragraph of Page I-391 be stricken.
- Page I-397 Last Paragraph
"employment rate in 1970" - should be unemployment rate.

Page I-455 We agree that rapid development may seriously effect the residents of an area. However, the increasing wealth of the area should provide the necessary vital public service for the new residents, as well as providing additional services for the present residents.

VOLUME II

Page I-459 Chapter V

This Chapter discusses the possible unmitigated environmental impacts. Many of the impacts discussed will probably not occur, such as uncontrolled stack emissions. State and Federal regulations require controls of stack emissions. We therefore feel that the impacts discussed in this Chapter are not "probable" impacts. In view of this, the title of Chapter V should be changed to "Possible Cumulative Regional Impacts" and Paragraph 1 should explain that these impacts are exaggerated and will not occur due to mitigating measures that are required in the lease and by State and Federal regulations.

Page I-460 Footnoting of reference material would be helpful here and in all other sections to aid the reader and reviewer.

Page I-461 A specific analysis of the figures quoted here would be advisable.

Example: The two new mines will each disturb about 100 acres per year (1000 acres cumulative from 1985 to 1990). The power plant will occupy about 200 acres. Thus, total disturbance for the mines and power plant would be 1200 acres. (Note - we feel this example is a more realistic figure for actual disturbance than the 9200 acres shown in the E.I.S.)

Page I-468 The gross figure of 20 to 200 Ug/m³ should be quantified with specific expected sources and compared with the allowable under State and Federal regulations.

- Page I-469 Reclamation is a mitigating measure and the acreage being reclaimed should not be included in the disturbed acreage figures. Also, the stripping and mining operations must be carried on concurrently. Thus, the maximum disturbance would be 100 acres per mine and not the 500 acres shown in Paragraph 2.
- Page I-476 The acreage figures in Table 5 are unrealistic even without mitigating measures. Please see our comments for Pages I-57, 58 and 59.
- Page I-485 A paragraph should be added here stating that the Dave Johnston and Belle Ayr Mines have not had to supply water for reclamation inasmuch as the rainfall has been sufficient for successful revegetation.
- Page I-487 Figure 3
This should be broken down into two figures to show what is available for the study area and what is available for the entire basin.
- Page I-496 Reclamation is a mitigating measure and should not be in this section.
- Page I-499 Same as I-496
- Page I-500 Same as I-496
- Page I-501 In a prior section of this E.I.S., statistics are given which indicate that water studies have been made for Wyoming. These studies show that a surplus of water will exist even after all known coal development projects have been included. It is important that the E.I.S. shows what percentage of the million acre feet of water is required for the coal development area.
- Page I-505 It is interesting to note that 27,000 of the 29,000 acres to be disturbed are scoria or sagebrush lands. Reclamation in these areas should definitely improve the range grasses, thereby improving grazing capacity.

Page I-503 Please see our comments for I-57, 58 and 59.

Page I-512 Paragraph 1

This section on power lines should be expanded into a full section. The treatment seems inadequate to anticipate potential impacts. The proposed line from Casper to Sheridan should be shown on Figure 83, Page I-386. (See our comments on Page I-374)

Page I-516 Both Devil's Tower and Keyhole Reservoir are 35 to 40 miles east and northeast of the mining and development area, therefore, the assumptions in Paragraph 2 may not be appropriate.

The Laramie Range lies 65 miles southwest of the coal area so the probability of reduced air quality affecting the view from Interstate 25 is nil. Similarly, the view of the Black Hills and Rochelle Hills would be little affected.

Page I-518 The figures on the destruction and loss of fish and wildlife may ultimately prove to be exaggerated. In the areas to be mined, the reclaimed land will be seeded with grasses suitable to the wildlife indigenous to the area. Therefore, it is not unreasonable to assume that the deer, antelope and other wildlife may actually prosper.

Page I-546 Table 15 should be footnoted in accordance with the last sentence of Paragraph 1, Page I-547.

Page I-550 This implies that all the coal production will use the line between Gillette and Douglas. How much will be handled on the railroad line east of Gillette? Also, some of the production may move by a slurry pipeline. It would be very helpful if a table were included showing the anticipated production, mode and direction of travel from each mine.

Page I-556 It appears that the entire employment and population increases presented on Pages I-554 to I-560 have been attributed to coal development. In reality, however, uranium and other mining will contribute at least 25% of what coal contributes to the increased population. The employment and population increases attributable to coal

Page I-556 Continued

development alone should be analyzed and presented separately.

Page I-560 Paragraph 1.

The employment projections are not shown on the reference table indicated.

Page I-562 to I-564 It would be informative if the employment and population data attributable to coal development be superimposed and properly identified on Figures 11 through 13.

Page I-566 Paragraph 4. Table 45 shows the total increase in basic coal industries to be 5,281 basic jobs between 1970 and 1990, using the factor 2.8, this calculates to 14,786 jobs, not 30,000 as indicated in this paragraph and throughout the Environmental Impact Statement.

Page I-574 It appears that the income analysis summary is contrary to the income statement on Page I-594.

Page I-612 to I-645 As an aid to understanding the full impact of the E.I.S. and to comply with the requirements of NEPA, it is imperative that the Federal, State and local environmental laws now in effect be "matched" with the unmitigated effects detailed in Chapter V, Volume II. In this way, all living forms that constitute the population of the region can be assured that adverse environmental effects will be mitigated during all development related to coal.

Page I-642 to I-644 The recommendations regarding changes in Federal, State and local laws and regulations would seem to be inappropriate for inclusion in an E.I.S. Further, recommendations such as these may be beyond the authority and intent of NEPA. If after the thorough comparative or "matching" of impacts of mitigating measures mentioned above, there are significant unmitigated impacts then 43CFR, Part 23 could be utilized without changing Federal, State or local laws.

Page I-647 Table 1 would be more meaningful if each column indicated the following:

- a. possible emissions without controls
- b. emissions with controls
- c. emissions allowable under State and Federal controls

Table 1 should indicate that the emissions include only the proposed projects for which this E.I.S. is being written.

Page I-649 Table 2 (title) indicates that the total emissions summary represents all Wyoming intrastate regions. The table should portray only total emissions attributable to the projects analyzed in this E.I.S.

Page I-651 Paragraph 2 Subsequent to each mining cut, the overburden will be covered with topsoil from the next mining sequence. Therefore, little destruction of the topsoil horizons will occur.

Paragraph 3 - is a positive statement which does not indicate that good reclamation procedures may possibly increase productivity, permeability and infiltration rates and reduce erosion and sedimentation rates.

Page I-653 Paragraph 3 The use of ground water will probably not exceed the recharge capacity so there will be no subsidence.

Paragraph 4 The development of lakes at the termination of mining would be a beneficial impact to recreation, agriculture, fishing, wildlife and grazing.

Page I-655 Mined land reclamation will occur in close sequence with operations. Therefore, a table showing the acreages being mined and reclaimed in five year sequences will indicate the maximum disturbed and unreclaimed acreages during that five year period.

Page I-656 It would be helpful to indicate what unmitigated impacts will occur on known archeological and paleontological sites. If none are known within the proposed development areas, this should be so stated.

Page I-657 It would be helpful to indicate that there will be no direct unmitigated impacts on any known historical sites, even though development may indirectly affect the sites mentioned in Paragraphs 1 and 3.

Page I-659 It would be appropriate to prepare a table for inclusion in this section showing the anticipated unmitigated impacts on fish and wildlife during each five year period of development. In this way, the statistical table suggested for Page I-655 could be used to substantiate and explain the projected losses.

Page I-662 Paragraph 2, 1st Sentence It is suggested that the following be added:

After "1990" add the statement, "or about 28 cows displaced per year".

Page I-664 thru I-668 We feel that our comments under I-556 would also be appropriate here.

Page I-670 Paragraph 3 A few of the significant impacts of replacing Powder River Basin strip coal with deep mined coal from Illinois, Kentucky or Pennsylvania would be:

- (a) Significantly higher numbers of employees required for deep mined coal (between 15 to 20 times as many employees required to mine deep coal vs. the same tonnage of this strip coal.
- (b) Approximately 4,155 more employees disabled per year and possibly 650 to 700 more deaths from accidents by 1990.
- (c) A significant increase in industrial diseases, such as black lung.

Page I-673 Eastern coal may or may not be cheaper, considering the high cost of stack gas emission control equipment, such as "scrubbers".

Page I-677 Paragraph 1 This is essentially EMARS which we feel would not require special legislation.

Page I-679 Paragraph 2 The coal seams in the Powder River Basin range up to 90 feet thick. Estimated recovery for room and pillar method of mining coal should therefore be based

Page I-679 Paragraph 2 Continued

on seams up to 90' thick. Approximate maximum recovery of a 90' seam of coal by room and pillar method of deep mining would be 7% to 10% as compared to the 65% implied in Paragraph 2.

Page I-680 thru I-683 Longwall mining is discussed as an alternative to the proposed surface mining. However, longwall mining in coal seams up to 90' thick may not be technologically feasible. As with room and pillar method of coal mining, an estimate of the percentage of coal recoverable by longwall should be given.

Page I-684 Paragraph 2 A major impact which may take place from in-situ production would be the baking and sterilization of the surface soils.

Page I-702 The assumptions favoring Federal coal development cannot be substantiated as they are basically untrue. It is suggested that this alternative be rewritten in accordance with the National policies expressed by Congress in Public Law 91-631 (Mining and Mineral Policy Act of 1970). In addition, a major impact not evaluated concerns the loss of a State's rights involving control over a resource under Federal development.

Page I-704 Line 2 1,000 to 2,000 acres for a 10,000 megawatt power plant would be reasonable, however 10,000 acres appears excessive.

Paragraph 1 6,000 acres for three generating plants would be reasonable. The railroad acreage figure also appears excessive.

Paragraph 4 Technology for removing the sulfur dioxide from coal-gas is presently available.

Page I-705 Table 2 Should be footnoted to explain that these are not waste products or atmospheric emissions.

Paragraph 3 Both char and powdered sulfur are not waste products but marketable by-products.

- Page I-706 Paragraph 2 With .5% sulfur coal, there would be 10 to 20 times this much sulfur to sell.
- Page I-709 The comparable figure for natural gas is off by a factor of 1,000,000 = 10^6 .
- Page I-743 thru I-780 Production and reserves of on-shore oil and gas are projected to continue their long-term decline -- even with the present increase in exploration and development. We, therefore, suggest that the E.I.S. state that this alternative is not feasible.
- Page I-781 thru I-798 The Paragraph on Page I-792 can be strengthened by including the President's objective of Project Independence. To emphasize that imports are not a viable alternative, the Paragraph on Page I-792 should be placed at the beginning of the sections discussing oil and gas imports.
- Page I-802 thru I-804 An analysis of the environmental impacts associated with the dumping of sludge from the wet limestone scrubbers currently being tested should be included. The sludge will approximate 30% of the high sulfur coal utilized (20% limestone, 10% ash). The environmental impacts of mining the limestone required by the wet scrubbers (20% of the coal utilized) should also be analyzed.
- Page I-805 The underground mining would require nine times the area (50% recovery).
- Page I-824 Another major impact would be the tremendous loss of water due to evaporation. A figure showing the acreage necessary to develop the equivalent hydroelectric power would be helpful.
- Page I-827 It would require 15 plants the size of the Great Canadian Oil Sands operation to produce the equivalent Btu and would therefore require more employees than the equivalent coal production; thus, the social-economic impacts would be far greater.
- Page I-860 If the social environment is a personal judgment factor there is no reason to suggest that either the short or long-term trend will be a decline. To many, the changes will be beneficial and the trend will be an increase, therefore, the next to the last sentence should be rewritten stating that

Page I-860 Continued

"The changes in the social environment will be moderate to 1980 while development is first beginning and will accelerate rapidly over the next five years."

Page I-861 These figures appear to significantly differ from the mitigated impacts analyzed on Page I-662.

Page I-862 With properly supervised and pre-planned reclamation as outlined under mitigating measures, there should be no mixing or loss of topsoil productivity. The analysis on this page indicates that neither pre-planning or reclamation supervision will be effective.

Page I-863 Paragraph 3 The 300 head of elk anticipated to be lost differs from the total 90 head count shown on Page II-171.

Page I-871 Paragraph 2 These figures on AUM's lost by 1990 (33,200) do not compare with the totals shown on page I-662, 5,067 AUM's by 1990.

VOLUME III and IV

The E.I.S. does not indicate whether or not the site specific reclamation objectives proposed by each company are acceptable. Furthermore, if the proposed reclamation objectives are not acceptable and there are more desirable objectives, they should be outlined and analyzed. This is a basic deficiency of the E.I.S. which precludes constructive comment on Volume III and IV.

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT, REGIONAL ANALYSIS
DEVELOPMENT OF COAL RESOURCES IN THE POWDER RIVER BASIN OF WYOMING

SUBMITTED ON BEHALF OF AMAX COAL COMPANY

I. Climatology

Volume I, Part 1, Chapter 4

The climate of the area is adequately defined in this chapter. The data used are from the 1931-60 period of record and there has been change when considering the 1941-70 period. The material on climate prepared by the Wyoming Water Resources Institute is more current and more complete than the data presented in the Statement, consideration should be given to integrating the Wyoming Water Resources Institute information into the report.

II. Soils

Within the section on soil association descriptions there are several major characteristics which have not been taken into consideration.

1. Within an individual section on soil description the present production capacity of that soil is not mentioned except in the most general terms. The author(s) have not taken into account the value of the soil in terms of its capacity to produce food, grains or cattle fodder.

2. No mention and no data are available on major or micro-nutrient content of the soil.

3. The author(s) provide no quantitative or semi-quantitative data on the specific soils present rate or potential rate of erodibility. Specifically, since much of the vegetation cover has been removed through excessive overgrazing. In this Section the author(s) have failed to mention these three items and have, consequently, presented generalizations with no quantitative data based on field observations and measurements or laboratory analysis to substantiate these generalizations.

III. Geology

There are two aspects of this section of the report which need some additional work. First, the author(s) description of the bedrock formations, especially those of economic interest lacks organization and coherence. There are entire paragraphs in sections which would be better placed elsewhere. Second, the author(s) put in only a minimum effort on the descriptions of the formations of economic interest; the Fort Union, Wasatch and Lance. There are several sections in this report which are very good. The areas dealing with the unstrippable coal deposits, reserves and coal quality are very informative and provide a good general description of the situation. The sections on oil and gas, uranium and clinkers give a further idea of the economic potential of the area in question.

IV. Reclamation

The author(s) state that soil permeability and infiltration rates on graded spoils will decrease drastically. No quantitative data on infiltration rates and permeability is given to support this assumption. Graded spoils having no inherent soil-forming ability is another assumption which is made with no data to justify it. Still another assumption is that soils which do form on the spoils will have characteristics totally dissimilar to those of present soils.

Some specific sections which should be reconsidered are as follows:

I-59 The statement is made that mining technology will not change significantly through the year 1990. In view of the progress that has been made in mining technology over the past fifteen years how can such a comment be justified?

The statement that there is a "5-year lag" in rehabilitation is not supported by any data presented.

The statement that "mine areas will be reclaimed for livestock grazing" (grass species) is an oversimplified statement as recreational, wildlife and other inter and intra related reclamation plans are being considered.

The statement that a 50% loss in productivity will occur is, likewise, not supported by any data presented.

I-61 Line 15 "Companies will be required to salvage topsoil in accordance with recommendations of the Wyoming State Department of Environmental Quality and/or the Federal Agency having jurisdiction over the land surface". In the Wyoming area, Campbell County, the word "topsoil" should not be used. In this area the more appropriate word would be "soil material". This is the zone which lies from the top of the ground to the top of the shale. This is the material that should be saved and put back on top of the finished spoil. Also, there are areas where the top layer of material is shale and is a material which is less suitable, less desirable than the soil material defined above. Anywhere in the report the word "topsoil" appears it is suggested that the word should be deleted and replaced by the words "soil material".

On page I-62 Line 3 "Topsoil covering initial pits, box-cut overburden area, rows and plant sites will be stockpiled outside the coal outcrop in areas that will not be disturbed in mining or covered with overburden". Where possible, soil material should be placed on lands that will be affected by mining at a later date. This will save, or minimize, the total affected area that will be disturbed by the mine operations.

On page I-72 line 14 "The topsoil that will be removed is oxidized and weathered material found within the 'root-zone' capable of supporting plant growth". This sentence apparently is included to define the term topsoil. However, since the root zone of various plants will vary substantially it is not really of much help.

On page I-62 line 21 "After the soil material is removed the earth and rock overlying the coal bed 'overburden' will be excavated from the

first cut and placed on land which is otherwise undisturbed and located outside the area to be mined". This sentence does refer to the term soil material as has been defined above. This is the first time that these words are used in the report. Again, this sentence refers to placing soil material in a stockpile reserve area in an area that is undisturbed and located outside of the mined area. This is a bad practice, as stated above, and can lead to many acres being disturbed or affected that might not otherwise need to be affected if the stockpiles were placed in a mine zone that will be disturbed at a later date.

In Figure 3 I-67 this figure is a cross section of typical dragline surface mining operation. In reviewing this section there is a cross-hatched area indicated as being parting material. As a general rule, this is not the proper location for the parting material as indicated on this section. The parting material should be placed at the base of the coal seam that is being removed and as close to the virgin highwall as possible. The material could possibly be toxic and it would probably better be utilized as a buckwall to hold the less stable upper stratas in the mining operation. Unless this material could be demonstrated to be non-toxic it should not be placed this high in the spoil bank.

On page I-79 line 16 a statement refers to the estimated percentage of revegetation. How was this 70-80% arrived at and does it compare with the growth of today on rangeland or was somebody thinking that today's rangeland should be as good as it is indicated here? The statement is not supported by any data.

On page I-79 line 23 "Some failures are anticipated owing to extreme climatic conditions, applications of improper rehabilitation techniques and unanticipated circumstances." While this statement is no doubt true, it is misleading in that unsuccessful rehabilitation efforts can be corrected and, in fact, will have to be corrected under existing State laws and Federal regulations.

On page I-85 line 3 "The highwalls of final cuts will be reduced by blasting and by grading the spoil back against the blasted highwall". This should be re-worded: "The highwalls of final cuts will be reduced by blasting and/or grading the spoil back against the blasted highwall." Blasting may or may not be required to achieve the final highwall slope required.

Volume 2 - I-523 contains several statements such as: 1) The "shrub" component will be absent or nearly so". 2) A "good" possibility exists that the re-established plant communities will "deteriorate" over time." 3) There will be a 50% reduction in vegetable cover. These statements are not substantiated by any data contained in the report. Number 2 above is particularly troubling in that basic care and awareness by the mining company personnel can effectively control stock grazing and so forth at adequate levels until the vegetative cover on reclaimed areas is firmly established.

V. Hydrology

On page I-78 the report states that hydrologic monitoring will be accomplished. Such monitoring as the author(s) propose and that

AMAX has initiated must be continued. In many instances, the development of knowledge of the physical system requires several years of observation and a complete understanding cannot be obtained with a brief, one-year look.

Starting on page I-195 an excellent overview of the water resources of the Eastern Powder River Basin is presented. With the limited data available the author(s) have developed a comprehensive sketch of the existing situation.

The AMAX hydrology study to date generally confirms the information in Figure 26, page I-224 with the provision that the term "shallow" does not necessarily mean the coal beds. AMAX has not been able yet to define with assurance the direction of water flow in the coal. It is important to note that the statement at the bottom of page I-222 and continuing on to the top of page I-225 and also on page I-255 wherein it is pointed out that while the groundwater flow is toward the stream channel there is no accretion of the flow in the channel and the water is used by evapotranspiration of the riparian vegetation.

Volume 2, part 1, chapter 5 - Probable curative regional impacts.

On page I-477 it is categorically stated that "soil productivity, permeability and infiltration rates will be reduced, increasing runoff, soil erosion and sedimentation...alteration of stream channels and increased velocity will accelerate erosion of streams and cause headcutting of the streams." This might be the case but it would not necessarily be so. With proper handling and planning the productivity, permeability and infiltration rates could be increased. The replaced channel can be meandered in such a manner that the slope will be the same as before mining so there would be no increase in the velocity with concomitant erosion and headcutting.

The section on water supplies is aimed at the requirements for on-site utilization of the coal. The one point of importance to AMAX on the bottom of page I-485 where it is stated "The water requirements for land reclamation have not been satisfactorily determined...". This statement is correct for some types of rehabilitation schemes if the desired rehabilitation is to return a land to nearly its original shape the supplemental (i.e. above precipitation) water requirements in the AMAX area are negligible.

On page I-492, aquifers are discussed. Here again, an unsupported statement is made. "Backfilling will not restore the aquifer even though some of the fill becomes saturated." If this statement were categorically true the proposed surface mining legislation now before Congress could prohibit mining. But such a broad categorical statement is not true. Indiscriminate dumping of shale overburden could act as a plug if water were moving through the original formation from a recharge source formation. This would be irresponsible mining and rehabilitation and a reputable company could selectively replace the overburden in such a manner as to increase the permeability and storage

coefficient.

In any event, mining and backfilling would not cause a solid plug from the Montana State Line to Douglas. The water would move around plugs "if they be that" and regionally there would be minimum impact.

Water levels will be lowered in the vicinity of the mines. This is a fact that cannot be argued. The land surface itself will be lowered. If the impact of lowering extended beyond the Company-controlled area the major effect would be to require lowering of wells. To offset this impact the Company might have to finance the extension of pre-existing wells.

On page I-493 it is implied that the lowering of the water table might affect the flow patterns in the vicinity of the mines. The streams near the AMAX mines are ephemeral in character and are not fed by the groundwater. The lowering of the water table could not decrease the flow a significant amount. The flow that does occur is in response to heavy rains and this would still be the situation. Observation of Caballo Creek at its mouth indicates the creek contributes to the Belle Fouché River exactly as would be expected of an ephemeral stream (only in response to heavy rains).

On page I-498 impacts on surface flows are discussed. It is stated "the annual and low flows of the streams would be increased by release of water pumped from the mines..." Experience to date at AMAX Belle Ayr South Mine indicates that the produced water is sufficient only for dust control and other industrial uses. The other impacts noted on this page are certainly possible and it would behoove the Companies to do some research on ways to minimize these impacts.

On page I-500 water quality is being considered. No deleterious effects on streamwater quality due to the Belle Ayr South Mine has been noted to date. It is agreed that "further studies including applied research and monitoring are needed."

Also, on this page the problems of leaching of backfill deposits is mentioned. Studies of the overburden in place are being done by AMAX. Studies and monitoring of cast overburden and selective placed backfill should take place as soon as possible.

Volume 2, Part 1, Chapter 7 - Probable adverse environmental effects which cannot be avoided.

Most of the unavoidable effects mentioned on page I-653 deal with the use of water for on-site coal utilization. The fourth paragraph indicates that "development of lakes, ponds and pits of water" would be an adverse effect. From the Aquatic-Biota study AMAX has done it is believed these would be beneficial effects. The evaporation loss would not be serious because of flow and underflow of Caballo Creek do not contribute to the Belle Fouché River except in times of flood.

IV. Biota

In Chapter 8, Volume 2 the reclamation objectives are listed.

The reclamation for grazing of domestic livestock is stated as the assumed goal but others are presented. These objectives are presented as being mutually exclusive, not reflecting the potential of all types of land use in the reclaimed areas. Surely reclaimed land can be developed and used for all possible objectives from farming and ranching to wildlife habitat and recreation.

The wildlife data contained in Chapter 4, Volume 1, seems quite generalized being based on a qualitative analysis. A more quantitative approach is called for and the problem should be approached in this manner. The quantitative impact of the coal development should be specified leaving as little as possible undefined or to chance.

The breakdown of the vegetative type into defined groups with dominant cover species and soil types outlined is a good ecological approach. This is further developed later by comments on the effect of cover type on raptor populations and distribution. Attempts should be made to unify the presentation to explain in a quantitative manner the ecological inter-relationships that exist.

The song-bird synthesis (done by the Ecological Consultants, Inc.) was interesting but it failed to state how large the plots are so the data is rendered less significant. The checklists of birds, mammals, fish reptiles and amphibians are well done. These checklists include potential occupants and visitors but exclude obvious impossibilities. A major fault of these checklists is the lack of references to either literature or techniques used to compile them. A specific comment the pelage caller, an eastern cottontail (*Silvagus Carolinensis*) has been seen in the Gillette area. They are common but are excluded from the checklist presented.

This section on endangered wildlife is entirely too short being based primarily on the "red book" published by the Bureau of Sports Fisheries and Wildlife. More research and literature review is recommended here.

The breakdown of fish species by drainage is an interesting approach and helps quantify preference of any species in the area.

Water - Most species, both plant and animal inhabiting this region, have evolved adaptations which enable them to exist in the arid climate. While introduced species may not have the benefit of these adaptations, this ecological fact should enter into any reclamation plan.

Table 2 in Volume 2 entails anticipated response to selected rehabilitation effort. Such a concept extended in more detail and complex fashion could be helpful in pinpointing areas of special concern. The breakdown of vegetation damage by cover type could also be developed further and used with Table 2 to quantify special rehabilitation needs of certain areas or species.

Losses of ungulates to fences should be minimized. Construction techniques have been developed to maximize passability of fences to ungulates while still containing domestic livestock. The losses of

elk and sage grouse due to man's presence should be quantified and detailed plans prepared to minimize these losses.

Appendix B contains needed emphasis on the impact of related off-site development (roads, towns and so forth). It is in this area that environmental impacts per se will be the greatest of a longer duration and with fewer opportunities of instigation. Secondary impacts should be investigated to the fullest and cooperation of local groups sought to formulate methods to reduce them.

The first major part of the Regional Analysis of Biota consisted of a baseline inventory of existing environmental conditions. This inventory was a good description of the life that presently existed in the region but it has four major weaknesses. These are: 1) The sources of the information for the various statements of fact were not cited. 2) The values of wildlife and native plants were little documented except for a brief discussion of game animals. 3) Two little field study was devoted to actually determining what species were present in the area. This was particularly noticeable in the discussion of the presence of the endangered and threatened species. Usually, the most that could be said was that the species "could" be in the area. 4) Almost no mention was made of how much of the existing land in the region has been badly exploited by intensive agriculture, particularly overgrazing. The reader is left with the impression that present conditions are "natural" and ideal which they are not.

The second major section of the Regional Environmental Impact Statement dealing with the effects of the mining on the Biotic environment also has its shortcomings. First, the section contains page after page of ideas on what effects mining will have on vegetation and animals. Yet practically no literature review or field study was conducted to back up the statements. Many studies have been conducted which could have been cited to verify many of the statements made. Other statements were made which are open to question and for which no back-up literature or field studies are available. Examples are: Biota losses over 30 years in duration are "permanent", page C-38. Recreational use will impair wildlife habitat, page I-525. Plants on revegetated areas will compound effects of fences on deer and antelope mortality, page I-526. Predator-prey interactions will be disturbed by human activity, page I-527 and an apparent assumption that all land directly affected by mining until 1990 (29,000 acres) will be completely lost to prong-horn antelope use (page I-531).

Further, the author(s) have adopted a negative attitude toward the effects of mining when a possible effect is unknown. For example, 1) Changes in micro-climate may have a "detrimental" effect on vegetation (page I-507). 2) Improved conditions for predators on mined lands are only expected to be "temporary" which ignores that when conditions deteriorate for them they improve for other species (Page I-528) 3) Since no satisfactory evidence is available saying that vegetated mined lands will satisfy deer needs "50%" of these lands will, therefore, be lost as deer habitat (page I-530). One other factor which detracts from this section is that much available supporting reasoning on the effects of mining on biota has been placed in the Appendix. This material belongs in the body of the report where it is needed to

help substantiate some of the statements that are made.

The next two major sections of the Impact Statement deal with significant mitigating measures needed to lessen mining impact on the environment and adverse environmental effects which could not be mitigated.

The section on mitigation measures does not contain a discussion of wildlife or native plant resources and the section on effects which could not be mitigated is essentially a re-hash of the conclusions set forth in the prior "effects of mining" section. Therefore, the reader must assume that the author(s) felt there was no way to avoid the biota losses caused by surface mining. This is not true.

The last section dealing specifically with vegetation and wildlife in the Statement is the material on short-term versus long-term uses of the environment by man. This is mostly a repeat of the material discussed in the section on the effects of mining on regional environment. Instead, what is needed here is a cost-benefit ratio analysis of using the area for mining now versus continuing to use it primarily for agricultural purposes. This analysis should include relative future benefits to wildlife, recreation, aesthetics and land productivity under both major types of management.

V. Socio-Economic

One general criticism of this section of the report is that it describes the conditions which exist in the area and presents programs which industry intends to implement by making only a small effort to analyze the impacts of these programs upon the existing conditions. By way of illustration, the following points are discussed.

Population - The major growth of Campbell County will be due to the development of coal and related industrial activities in and around the town of Gillette. Present projections are that the development of coal mines, gasification and electric power generation facilities should be completed within the next ten years. After that time the construction and development of coal and related industries should be complete and the population of Campbell County should stabilize. Nevertheless, most projections show a continued increase in population through the year 1990 and beyond. Obviously, other factors besides coal are contributing to the continued increase in population. These factors should be identified and explained. If these growth projections are valid it is quite possible that Gillette and Campbell County will become centers of commerce in northeastern Wyoming and that in the period of forty years coal and related industries will contribute only a minor amount to the area's economy.

Housing - The assumption is made that housing costs will be about \$26.00 per square foot. The source of this assumption should be included in the report. No doubt construction costs vary and it would be very helpful to include the range that is currently being used in estimating construction costs. To estimate the range of housing costs which people can afford the multiple of 1.8 times annual income is used. This multiple should be identified and the source from which

it is derived should also be identified. Some of this information was obtained by interviewing employees of three banks in the Cheyenne, Wyoming, area and may be different from the figures obtained in Casper and Gillette and should be confirmed.

No where in the report is there any discussion of the effect of working wives on housing. In recent years the number of working wives has increased with a corresponding increase in family income. Would the additional income generated by working wives be sufficient to increase the percentage of permanent housing in the Gillette area? Also, there is no discussion of projected wages in the Gillette area. During the construction and development phase of any mining operation there is a general shortage of labor with an attendant need for overtime work which also has the effect of raising family income. Income levels for entering coal and industrial workers were estimated to be from \$10,000 to \$15,000 per year. This figure may be low. It is recommended that current wage scales for coal and construction workers be obtained and an estimate of the amount of overtime which will be required during the construction and development phase also be made. These figures, when combined with the effect which working wives may have on family income, may change the picture with respect to permanent housing in the Gillette area.

Mobile homes and mobile home parks particularly as related to Gillette are depressing and unsightly. However, this need not be the case. In the mid 1960's an oil boom similar to that experienced by Gillette occurred in Cortez, Colorado. The sudden increase in the population of Cortez resulted in an influx of a large number of mobile homes. Within a short period the city of Cortez enacted ordinances to control mobile homes and mobile home parks. The result is that now, ten years after the boom, the mobile home parks in Cortez are quite pleasant. The lessons learned and applied in Cortez could be very helpful to the town of Gillette. A copy of the ordinances enacted by the city of Cortez should be obtained and evaluated for possible inclusion in the Environmental Impact Statement.

Education - the basis used to estimate student enrollment should be identified. The projections made of teacher deficiencies is unfair and misleading. Even though the basis is identified it indicates unjust pessimism. In the first place, as the student enrollment increases there should be a commensurate increase in the number of teachers hired by the School District. Secondly, with the current shortage of teaching jobs there should be little difficulty in attracting new teachers to the area. Finally, with the rapid increase in population it would not be unreasonable to expect that the spouses of some of the workers would be teachers looking for jobs. Although there may, in fact, be some deficiency that it is unfair to make an estimate of such magnitude without some basis.

Medical facilities - The estimate deficient with respect to physicians is more realistic. It is the experience of most small communities of being unable to attract doctors to their area, since most doctors

prefer to become specialists and practice in large urban areas. This problem is not unique to Gillette. It would be interesting to compare the ratio of physicians to population in a town, such as Casper and Cheyenne, with the present ratio in Gillette. It may be that the future expansion of Gillette will be such as to result in more favorable ratio of physicians to population. Similar estimates should be made with respect to other forms of medical personnel, such as licensed practical nurses and registered nurses. However, any deficiency should be the result of a realistic appraisal and not merely a comparison of future estimates to current availability. Realistic recommendations which would lessen the impact of any shortage of positions should be included in the report.

Land requirements - As Campbell County increases in population there will be a commensurate increase in urban area. Methods of handling this increase should be identified and discussed. Alternatives which should be considered are the creation of a new town or towns, annexation of the area to the town of Gillette or assumption of Governmental responsibilities by the County Government. A new town poses problems of start-up and organization during a time when most of the effort will be directed to the start-up of new industry and business. Apparently, in the state of Wyoming, County Governments do not have the broad powers which are necessary in providing the various Governmental services required. Municipal governments, on the other hand, do have the necessary powers and flexibilities to provide this service. The present city limits of Gillette are probably too small to absorb the projected population increases. It is safe to assume that some form of annexation will be necessary and that services such as water supply, sewage disposal, schooling and so forth will be handled by the Municipal government of Gillette. If advanced financing of these facilities is seriously contemplated by the various companies involved it may be to their advantage to route this advance financing through the town of Gillette rather than to go through the County Government or to attempt to start a new municipality. If this analysis is correct, the alternate methods of assisting the city of Gillette should be identified in the recommendations included in the final draft of this Environmental Impact Statement.

Alternatives - There seems to be an underlying philosophy in the Draft Statement which is similar to that expounded in the problematic Environmental Impact Statement on Federal Coal Leasing. This underlying philosophy reflects a one-sided bias towards reclamation, social economic problems and Government control of coal and very little appreciation for the economic reality of conducting mining operations. One cannot separate reclamation and social economic factors from the practical economics of coal mining. The greater the economic constraints which are placed upon the mining operation, the greater the need to generate increased profits to pay for these constraints. Industry is the bread-winner of the nation and it an unwise policy which requires the bread-winner to go hungry. By way of an illustration, the following points which are included under "alternatives and proposed action" are discussed.

No new development - under this alternative, current mining activities would be allowed to continue to completion on presently approved leases and mining plans. The presently approved leases and mining plans are

of relatively short duration. There is extensive discussion of the impacts on the physical resources but no discussion of the economic impact on the mines now in production or the railroad which has recently completed the spur to the Belle Ayr Mine. The premature shut-down of these operations could cause an economic hardship on these companies which was not even considered in the Environmental Impact Statement.

Delay of pending new technology - The discussion in this section focuses on the environment. This time on the environmental problems faced by the consumer and alternatives open to them. Any protracted unplanned delay has an economic impact on a coal operation as well as on the consumer. Some attempt should be made to determine these impacts.

In phase and staged with social economic development - this alternative suggests the development of a natural resources management development and utilization program for the Powder River Basin that would be coordinated with the rate of social economic development. This sounds like EMARS and goes so far as to suggest that the Federal Government buy back the lease-hold interest. In effect, this alternative suggests the Government control of mining. In addition to not considering the economic impact on coal operators, government control of coal as presented by EMARS falls far short of being an effective instrument for planning effective allocation of our energy minerals resources. Under EMARS projections are made for four years, yet effective planning requires projections between 10 and 20 years. EMARS does not understand the role of prospecting and exploration as a planning tool and fails to recognize the lead time necessary between the identification of a target and the consummation of the economically viable mining operation. Because of this lack of understanding there is every reason to believe that the Government control of coal mining in the Powder River Basin would fail to be effective.

Control number of producers, control location of the depletion by designated area of production - again Government control of coal mining.

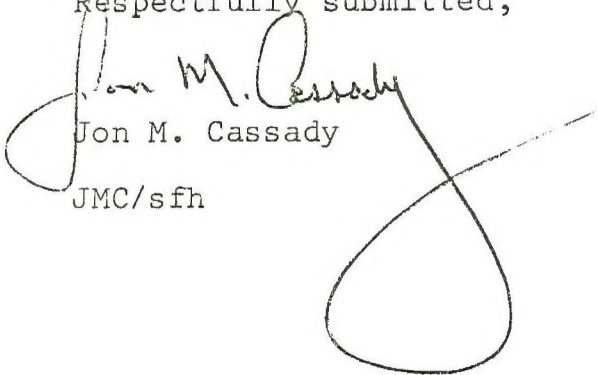
Under alternative extraction methods there are about seven pages devoted to underground insitu and auger mining. This could be condensed since descriptions of methods are unnecessary.

Underground coal mining is limited to maximum height of about 12' with heights of 7 to 8' being ideal. The reason for this is the weakness of the coal and the difficulty of controlling the "back" or "roof" at height much greater than the normal reach of a man. The weak nature of the coal also allows recovery of only a portion of the support pillar with the result that up to 95% of the coal contained in a thick western coal seam would be left in place. In all probability, the amount of coal remaining would be sufficient to justify strip mining which is what we are trying to avoid in the first place. Why not mine the coal from the surface to begin with. Underground mining of thick western coal seams would be economically unsound, an exercise in futility and at worst a poor conservation practice.

Insitu mining and auger mining are also unrealistic. Insitu mining is

a unproven method that promises extremely low recovery of energy (1-5%) while auger mining is used as a last resort to mine beds which are otherwise uneconomical. Recovery with auger mining is very low and is not used where other methods are feasible.

Respectfully submitted,



Jon M. Cassady

JMC/sfh

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION
Denver, Colorado 80225

DATE: July 30, 1974

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT
DEVELOPMENT OF COAL RESOURCES IN THE
EASTERN POWDER RIVER COAL BASIN OF WYOMING

in reply
refer to: 08-00.21

FROM : Daniel Watt *[Signature]*
Regional Federal Highway Administrator

TO : Mr. Rex I. Wells, Chief
Environmental Development Division
HEV-10 Washington, D.C.

We appreciate the opportunity to review and comment on the draft environmental statement for the above project. The following comments are offered:

1. Analysis of State, County and City highway and street need is rather lacking. While it is mentioned to some degree, the emphasis is more on increased maintenance costs of the Wyoming Highway Department. Not too much is said about mileage of new highway and street construction or reconstruction which will be required.

2. We note that the railroad network shown does not include the Burlington Northern rail lines south of Douglas to Wendover Junction, then east via Torrington or south via Cheyenne. The rail line shown going east from Douglas is the Chicago and North Western. Increased rail traffic will cause increased train/car conflicts at grade crossings along all these lines. This will require increased crossing protection and, in some instances, separation of railroad and highway. In some locations where separation may become highly desirable, it may only be possible with substantial disruption to the community.

3. Regarding revegetation, we feel that all topsoil should be salvaged and stockpiled and provisions should be made to topsoil, seed, mulch, and fertilize all disturbed areas to the maximum extent possible. Since this is ranching and grazing land country, fencing of highway and railroad rights-of-way is important for game animal and livestock control, their safety and that of the motoring public.

4. Of great concern is the effect which diversion of resources to the Powder River Basin would have on the total statewide highway program. Without the proposed coal development, the highway department, at the present time, has more pressing needs in other areas of the State. With the coal development the highway department estimates it will cost \$175 million to provide needed improvements to State highways in the Powder River Basin. This does not include costs of constructing streets within

(more)

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communities which might be included on the state or federal-aid highway systems, nor does it include costs of upgrading railroad-highway crossings.

5. As has become clearly evident in the Rock Springs-Green River, Wyoming area, expansion of transportation facilities and public services should be provided in harmony with population growth. Planning must begin now so that programs can be formulated to provide these facilities, and services in a manner that will promote orderly and desirable community growth. The statement indicates that the growth rate will peak between 1980 and 1985. Therefore, construction of needed facilities and expansion of services should begin within a few years.

6. We do not feel the statement adequately addresses the source of human, material and financial resources to provide the needs enumerated above and in the statement. Certainly initial funding requirements are beyond the capabilities of State and local agencies to provide. We believe more analysis of funding requirements for the whole range of facilities and services needed, and possible sources of financial assistance would be in order.

cc: TES-70(1)
DOT-(1)
CEQ-5

BUREAU OF LAND MANAGEMENT
Library
Denver Service Center



